frame frequency 24, the color field frequency 48, and the line frequency 29,160 per second.

13. The level at maximum luminance shall be 15% or less of the peak carrier level.

[fol. 472] (3) The following new paragraphs "19" and "20" are added to Section 2 A:

19. The color sequence for color transmission shall be repeated in the order red, blue, green in successive fields.

20. The transmitted color characteristics for color transmission shall be such as to reproduce the transmitted colors as correctly as the state of the art will permit on a receiver having the following trichromatic co-efficients, based on the standardized color triangle of the International Commission on Illumination:

| *Red* | *Blue* | *Green* |
|---|---|---|
| x = .674 | x = .122 | x = .227 |
| y = .326 | y = .142 | y = .694 |

(4) New "Appendix I" attached hereto entitled "Television Synchronizing Waveform" is substituted for "Appendix I" of the "Standards of Good Engineering Practice Concerning Television Broadcast Stations".

Federal Communications Commission*, T. J. Slowie, Secretary.

Released: October 11, 1950.

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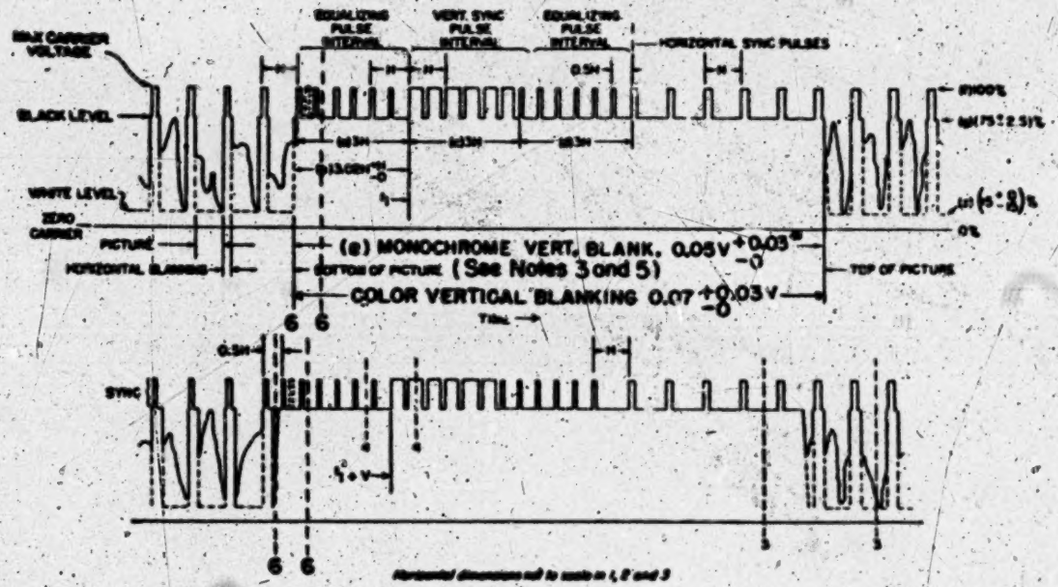
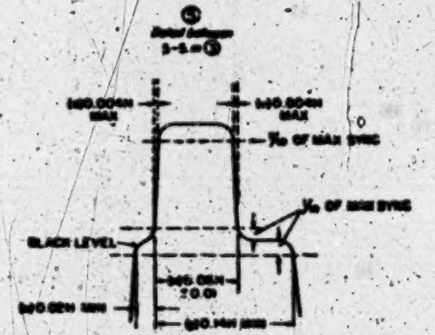
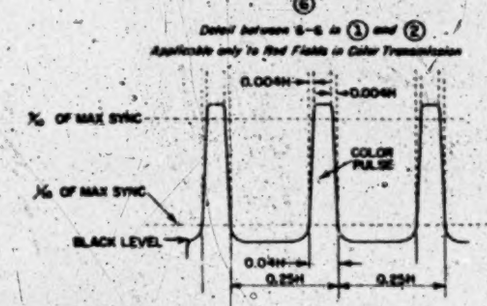
* Commissioners Sterling and Hennock dissenting.

Here follows 1 Photolithograph side folios 473-474.

# TELEVISION SYNCHRONIZING WAVEFORM




NOTE

1. H = Time from start of one line to start of next line
2. V = Time from start of one field to start of next field
3. Leading and trailing edges of vertical blanking should be complete in less than 0.1H
4. Leading and trailing slopes of horizontal blanking must be steep enough to preserve maximum and minimum values of (vy) and (i) under all conditions of picture content
5. Dimensions marked with asterisk indicate that tolerances given are permitted only for long time variations and not for successive cycles
6. Equalizing pulse area shall be between 0.45 and 0.5 of area of a horizontal sync pulse
7. Color pulse area shall be between 0.45 and 0.5 of the area of a horizontal sync pulse
8. Refer to text for further explanations and tolerances

APPENDIX I





F.C.C. - WASHINGTON, D. C.

[fol. 475] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

NOTICE—Filed October 24, 1950

To: Attorney General of the United States, Washington, D. C., United States Attorney for the Northern District of Illinois, United States Court House, Chicago, Illinois, Federal Communications Commission, Washington, D. C.

Please take notice that on October 30, 1950, at the opening of Court in the forenoon of said day, or as soon thereafter as counsel can be heard, the undersigned will appear before the Honorable Philip L. Sullivan, Judge of the aforesaid Court, in the courtroom usually occupied by him in the United States Court House, Chicago, Illinois, and shall present to the Court a written motion for a temporary injunction and other relief, copies of which motion are served upon you herewith.

Weymouth Kirkland, Kirkland, Fleming, Green, Martin & Ellis, by Weymouth Kirkland, A Member of the Firm, Attorneys for Plaintiffs, Office and P. O. Address, 33 No. La Salle Street, Chicago, Illinois.

Of Counsel: Cahill, Gordon, Zachry & Reindel, New York City. John T. Cahill, Joseph V. Heffernan, John W. Nields.

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[fol. 476] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

MOTION OF PLAINTIFFS FOR TEMPORARY INJUNCTION AND OTHER RELIEF—Filed October 24, 1950

Now come plaintiffs, Radio Corporation of America, National Broadcasting Company, Inc. and RCA Victor Distributing Corporation, and respectfully move:

1. That a temporary or interlocutory injunction be entered herein restraining, enjoining and suspending until further order of this Court the promulgation, operation and execution of the Order of the Federal Communications Commission issued October 10, 1950, effective November 20, 1950, adopting the Columbia Broadcasting System, Inc. (CBS) color television system for commercial broadcasting

of color television (which Order is more fully described in paragraph 1 of the complaint herein), on the grounds set forth in said complaint;

2. That this Court convene a specially constituted court of three judges, as required by Title 28, United States Code, Sections 2284 and 2325, to hear and determine said motion, as well as to hear and determine all other matters in this cause requiring determination by such a specially constituted court in accordance with the law in such cases made and provided;

[fol. 477] 3. That the foregoing motion for a temporary or interlocutory injunction be set for hearing before such three-judge court on the earliest date practicable for the Court and counsel for the respective parties;

4. That in the event said motion for a temporary or interlocutory injunction shall not be determined prior to November 20, 1950, the effective date of said Order, a temporary restraining order be entered herein restraining, enjoining and suspending until further order of this Court the promulgation, operation and execution of said Order, to prevent irreparable injury and damage to plaintiffs;

5. That plaintiffs be permitted to file affidavits in support of such motion at any time up to a date five days before the date of such hearing and that defendants be permitted to file answering affidavits at any time up to a date one day before the date of the hearing, such motion to be heard on the verified complaint, the exhibits attached thereto and said supporting and answering affidavits;

6. That plaintiffs may have such other and further temporary relief as equity and justice shall require and as this Court shall deem appropriate under the circumstances.

October 24, 1950.

Weymouth Kirkland, Kirkland, Fleming, Green, Martin & Ellis, by Weymouth Kirkland, A Member of the Firm, Attorneys for Plaintiffs, Office and P. O. Address, 33 No. La Salle Street, Chicago, Illinois.

Of Counsel: Cahill, Gordon, Zachry & Reindel, New York City, John T. Cahill, Joseph V. Heffernan, John W. Nields.

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[fol. 478] [File endorsement omitted]

[fol. 479-480] [File endorsement omitted]

IN UNITED STATES DISTRICT COURT

[Title omitted]

ORDER—Filed October 31, 1950

The undersigned Chief Judge of the Court of Appeals for the Seventh Circuit, having been notified by Honorable Philip L. Sullivan, United States District Judge for the Northern District of Illinois, Eastern Division, of an application for injunction and other relief in the above entitled cause, does hereby, pursuant to Sec. 2284 of the Revised Judicial Code, designate the Honorable J. Earl Major, Circuit Judge of the United States Court of Appeals for the Seventh Circuit, and the Honorable Walter J. LaBuy, a United States District Judge for the Northern District of Illinois, Eastern Division, to serve as members of a three-judge district court to hear and determine the above-designated action or proceeding now set for hearing on Tuesday, November 14, at 10:30 a. m., and for such further time as may be required.

Dated this 30th day of October, 1950.

J. Earl Major, Chief Judge, U. S. Court of Appeals.

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[fol. 481] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

MOTIONS TO DISMISS THE COMPLAINT OR, IN THE ALTERNATIVE, FOR SUMMARY JUDGMENT—Filed October 30, 1950

Upon the complaint herein and upon the annexed affidavit of Benedict P. Cottone, sworn to the 27th day of October, 1950, and upon all the other papers and proceedings heretofore filed and had herein, the defendants in the above-entitled cause move this Court that the complaint be dismissed or, in the alternative, for summary judgment in their favor.

A. The grounds of the motion to dismiss the complaint with respect to plaintiffs National Broadcasting Company, Inc. and RCA Victor Distributing Corporation are:

1. Plaintiffs National Broadcasting Company, Inc. and RCA Victor Distributing Corporation fail to state a claim

upon which relief can be granted in that, among other things, no legal damage is alleged.

2. The Court lacks jurisdiction over the subject matter of the claims asserted by National Broadcasting Company, Inc. and RCA Victor Distributing Corporation. These plaintiffs lack standing to bring this action and therefore no justiciable controversy with respect to them is presented by their complaint.

B. The grounds of the motion to dismiss the complaint with respect to plaintiff Radio Corporation of America are:

Plaintiff Radio Corporation of America fails to state a claim upon which relief can be granted.

[fol. 482] C. The grounds of the motion for summary judgment are:

Even if the Court have jurisdiction of the subject matter of this action with respect to all plaintiffs, the complaint together with the exhibits thereto annexed, the affidavits submitted on this motion together with the exhibits thereto annexed, and the other papers and proceedings heretofore filed and had herein, show, as to each and every of the plaintiffs, that there is no genuine issue as to any material fact and that defendants United States of America and the Federal Communications Commission are entitled to a judgment as a matter of law.

Dated: Washington, D. C., October 27, 1950.

John F. Baecher, Special Assistant to the Attorney General, Attorney for the United States; Benedict P. Cottone, General Counsel; Max Goldman, Assistant General Counsel; Stanley S. Neustadt, Daniel R. Ohlbaum, Robert D. Greenberg, Counsel, Attorneys for the Federal Communications Commission.

William Amory Underhill, Acting Assistant Attorney General; James E. Kilday, Special Assistant to the Attorney General; Otto Kerner, Jr., United States Attorney for the Northern District of Illinois, Attorneys for the United States.

[fol. 483] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

AFFIDAVIT OF BENEDICT P. COTTONE—Filed October 30, 1950

DISTRICT OF COLUMBIA
City of Washington, ss:

1. He is General Counsel of the Federal Communications Commission and as such is familiar with the Commission's proceedings with respect to color television taken pursuant to the Commission's Notice of Further Proposed Rule Making issued July 11, 1949, and that the proceedings included the following:

BENEDICT P. COTTONE, being duly sworn says:

(a) These proceedings relating to color television are part of a more comprehensive rule making hearing involving study and review of the existing commercial television service which occupies 12 channels in the frequency band 54 Mcs. to 216 Mcs. (the Very High Frequency Band, or VHF), (Dockets 8736 and 8975), a review of the status of television experimentation and development in the experimental frequency band 470 to 890 Mcs. (the Ultra High Frequency Band, or UHF), (Docket 8976), with a view to opening this portion of the spectrum for regular television operations and the amendment of the Commission's Rules, Regulations and Engineering Standards concerning the television broadcasting services, (Docket 9175).

(b) The color phase of the instant proceedings was instituted by the Commission's Notice of Further Proposed Rule Making, issued July 11, 1949. While in this notice the Commission did not propose specific amendments to its rules and standards looking toward the commercialization of color television, in Appendix A to the Notice the Commission described the conditions upon which it would consider proposals for a change in transmission standards on Channels 2 through 55 looking toward the establishment of color television. Paragraph 13(a) of the Notice stated:

[fol. 484] "13.(a) Appendix A hereto describes the conditions upon which the Commission will receive proposals for a change in Transmission Standards on Channels 2 through 55, looking toward the establishment

of color television. Persons with relevant information, especially those who have heretofore supplied information concerning color television or have demonstrated experimental color operation to the Commission, should file proposals in accordance with Appendix A and should be prepared to submit information concerning color breakup, flicker, color fringing, image registration, color fidelity, picture brightness, camera light efficiency, definition, field tests, and details with respect to modification of transmitters and receivers to provide the degree of compatibility contemplated by Appendix A, paragraph II-C-2."

Paragraphs II-B and C of Appendix A stated:

"B. The Commission will give consideration to proposals for a change in Transmission Standard on channels 2 through 55 looking toward color television or other television systems. Any such proposal shall:

1. Be specific as to any change or changes in the Transmission Standards proposed; and

2. Shall contain a showing as to the changes or modifications in existing receivers which would be required in order to enable them to receive programs transmitted in accordance with the new standards.

"C. It is proposed to consider changes in Transmission Standards for Channels 2 through 55 only upon a showing in these proceedings that:

1. Such system can operate in a 6-megacycle channel; and

2. Existing television receivers designed to receive television programs transmitted in accordance with present transmission standards will be able to receive television programs transmitted in accordance with the proposed new standards simply by making relatively minor modifications in such existing receivers."

(c) Pursuant to the above notice, comments relating in whole or in part to color television were filed by the Joint Technical Advisory Committee (JTAC); the Radio Manufacturers Association (Radio Manufacturers Association has changed its name to Radio and Television Manufactur-

ers Association); the Radio Corporation of America (RCA); the Columbia Broadcasting System, Inc. (CBS); Color Television, Incorporated (CTI); Charles Willard Geer; Leon Rubenstein; Philco Corporation; and Allen B. DuMont Laboratories, Inc. Webster-Chicago Corporation and American Television, Inc. also were made parties to the hearing upon their request. Celomat Corporation was permitted to testify in the hearing on its own behalf. CBS, CTI and RCA were the only parties who appeared as proponents of their own color television systems.

[fol. 485] (d) The hearing on the color issues was held before the Commission *en banc* commencing September 26, 1949 and ending May 26, 1950— a total of 62 hearing days, covering 9,717 pages of transcript. In all, 53 different witnesses and 265 exhibits were offered. The breakdown of the number of witnesses called and exhibits introduced by each of the parties to the hearing was as follows:

(1) Eight witnesses were called by RCA. Their testimony fills 2,183 pages of transcript and they introduced 67 exhibits.

(2) Twenty-three witnesses appeared on behalf of CBS and their testimony fills 2,368 pages of transcript. CBS also introduced 77 exhibits.

(3) CTI called six witnesses and their testimony fills 1,169 pages of the transcript. CTI introduced 56 exhibits.

(4) Four witnesses were called on behalf of the FCC and their testimony fills 286 pages of the transcript. The Commission also introduced 28 exhibits.

(5) RMA called four witnesses at the hearings. Their testimony fills 727 pages of the transcript and RMA introduced 9 exhibits.

(6) Two witnesses testified on behalf of Allen B. DuMont Laboratories, Inc. and their testimony fills 1,031 pages of the transcript. DuMont introduced 13 exhibits.

(7) American Television, Inc. called two witnesses, whose testimony fills 68 pages of the transcript, and introduced one exhibit.

(8) One witness testified on behalf of the American Telephone & Telegraph Co. and his testimony fills 127 pages of the record. The Company also introduced 3 exhibits.

(9) The Joint Technical Advisory Committee (JTAC) called one witness whose testimony fills 361 pages of the record. One exhibit was also introduced by JTAC.

(10) Celomat Corporation called one witness on its own behalf and his testimony fills 37 pages of the record. Celomat introduced 2 exhibits.

(11) One witness testified for Philco Corporation, filling 568 pages of the transcript and introduced 2 exhibits.

[fol. 486] (12) Western Union called one witness whose testimony fills 47 pages of the record and introduced one exhibit.

(13) Charles Willard Geer testified on his own behalf filling 113 pages of the transcript and introduced one exhibit.

(14) Raymond M. Wilmotte also testified, his testimony filling 72 pages of the transcript and introduced 4 exhibits.

(e) The hearing was held in two phases, the first of which ended on November 22, 1949, at which time the hearing was continued to February 6, 1950, later extended to February 20, 1950. The second phase commenced on February 20, 1950 and ended on May 26, 1950. During the intervening period between the first and second phase of the hearing, the parties conducted field tests of color television systems pursuant to the Commission's "Notice Concerning Field Test Programs and Further Testimony", adopted November 21, 1949. Progress reports concerning these field tests were filed with the Commission during December, 1949 and January, 1950, by RCA, CBS and CTI. The hearings were held in Washington, D. C., except for the second comparative demonstrations of the CBS, RCA and CTI color television systems which were held on February 23, 1950 at the Commission's Laboratories at Laurel, Maryland; the CBS demonstration of horizontal interlace held on April 26, 1950 at the CBS Laboratories in New York City; and the CTI demonstration held on May 17, 1950 at San Francisco, California.

(f) During the course of the hearing, the following demonstrations were conducted on the record of the proceedings:

(1) On October 6 and 7, 1949, CBS demonstrated its color system at the Carlton Hotel, Washington, D. C.

(2) On October 10, 1949, RCA demonstrated its color system at the Washington Hotel and the Wardman Park Hotel, Washington, D. C.

(3) On November 21 and 22, 1949, a comparative demonstration was conducted at Temporary "E"

Building, Washington, D. C., showing the operation of the CBS color system, the RCA color system, and conventional DuMont monochrome television receivers. At this demonstration, the Commission demonstrated a conventional Bendix television receiver equipped with the automatic adapater invented by members of the Commission's staff.

(4) On February 20, 1950, CTI demonstrated its color system at the Statler Hotel, Washington, D. C.

[fol. 487] (5) On February 23, 1950, a second comparative demonstration was conducted showing the operation of the CBS color system, the RCA color system, and the CTI color system, at the Commission's Laboratories at Laurel, Maryland.

(6) On April 6, 1950, RCA demonstrated its trichromatic (three-color) receiving tubes at the Trans-Lux Building, Washington, D. C.

(7) On April 26, 1950, CBS demonstrated its horizontal interlace at the CBS Laboratories in New York City.

(8) On May 17, 1950, CTI demonstrated its color system at the St. Francis Hotel, San Francisco, California.

(g) Pursuant to the Commission's Notice of May 10, 1950, the parties were permitted to file Proposed Findings and Conclusions on or before June 26, 1950, and replies thereto by July 10, 1950. Proposed Findings and Conclusions, and Replies were filed by Color Television, Incorporated (CTI), the Columbia Broadcasting System, Inc. (CBS), and the Radio Corporation of America (RCA). Paramount Television Productions, Inc. and Chromatic Television Laboratories, Inc., jointly filed Proposed Findings and Conclusions and a Reply as *amicus* pursuant to the Commission's letter of May 31, 1950.

(h) On September 1, 1950, the Commission issued its First Report covering the color television issues in these proceedings, in which it made detailed findings and conclusions concerning the three color television systems which were proposed to the Commission at the hearings and in which it set forth minimum criteria which a color system would have to meet in order to be considered eligible for adoption. In this Report the Commission found that the line sequential system proposed by CTI and the dot sequen-

tial system proposed by RCA fell short of the criteria established by the Commission as the indispensable minimum for the adoption of a color television system. The Commission further found that the field sequential system proposed by CBS did satisfy those criteria. The Commission did not in its First Report finally adopt the CBS color system. Instead, it set forth a procedure whereby, if the *status quo* on compatibility were maintained, a decision would be postponed so that the Commission could give further consideration to four matters—large-size direct-view tubes on the CBS system, horizontal interlace, long persistence phosphors, and the development of new com- [fol. 488] patible systems and improvements in existing compatible systems which have been informally called to the Commission's attention since the conclusion of the hearing. The Commission's First Report suggested a method whereby the *status quo* on compatibility could be maintained. This method was the incorporation of brackets into receivers hereafter manufactured which would permit such receivers to receive black and white pictures from present transmissions, CBS color transmission and any other transmissions within a range of 15,000 to 32,000 lines per second and 50 to 150 fields per second which would be specified in bracket standards for black and white television broadcasting.

(i) Concurrently with the First Report the Commission issued a Second Notice of Further Proposed Rule-Making providing for the adoption of bracket standards in the existing monochrome television system and invited interested parties and all manufacturers to submit comments on the proposal. During September, 1950, comments on the proposed bracket standards were received from 33 interested parties and television receiver manufacturers which indicated that the television receiver manufacturers were unwilling or unable to manufacture receivers with bracket standards within the time proposed by the Commission. On August 29, 1950, CTI filed a Motion to Reopen the Record and Take Further Testimony. On October 4, 1950, RCA filed a petition requesting that the Commission review the improvements made in the performance of the RCA color system and that the Commission view further experimental broadcasts of the three propo ed color sys-

tems before reaching a final determination with respect to color standards.

(j) Thereafter, on October 10, 1950, the Commission issued its Second Report in these proceedings, which found that the field sequential color system should be adopted. In its Report, the Commission contemplated further experimentation on color television by interested persons. Simultaneously with the Second Report, the Commission issued an Order amending the Commission's Standards of Good Engineering Practice, to provide for standards for color television transmission in accordance with the proposed field sequential system, effective November 20, 1950. Commissioners Sterling and Hennock dissented from the Second Report and the Order amending the Standards of Good Engineering Practice.

[fol. 489] (k) In addition, the Commission issued two orders on October 10, 1950 which respectively denied the petition of CTI to reopen the Record and take further testimony and the RCA petition to postpone a final determination of the color proceedings and to have further demonstrations of the three proposed color systems. Commissioners Sterling and Hennock concurred in the issuance of these two orders.

2. A certified copy of said portions of the proceedings before the Commission in Dockets 8736, 8975, 9175 and 8976 which relate to color television is filed herewith and incorporated herein by reference as Exhibit A.

3. One of the grounds urged by plaintiffs in support of their contention that the Commission's Order of October 10, 1950 adopting the color television standards is illegal, void and beyond the power and jurisdiction of the Commission is that the Commission's staff engineer who invented a device usable in the CBS color system, although he foreswore any financial interest in his device by assigning it to the United States Government, had his professional prestige and reputation at stake which could be furthered only if the CBS system were adopted; that the Commission relied on said engineer's advice; that he gave such advice in the absence of the parties and participated in the formulation and preparation of its Reports and the Order complained of and that, on the basis of the facts dis-

closed, said engineer should not have been permitted to continue in the hearings.

4. Affiant submits that Exhibit A is relevant to the above issue sought to be raised and it shows:

(a) That plaintiffs have not alleged that the actions of said staff engineer are in violation of law.

(b) That the hearing in these proceedings, when the device invented by said engineer in the course of his government employment and patented by the Government, was put into evidence (Exhibit 296), the attorney for RCA stated (P. 5982 of the transcript of the hearing included in Exhibit A):

> "Mr. McDaniel: Mr. Chairman, I have said all I think I need to say. There has been no development here by the Commission's engineering staff that I know of with reference to any other system. There are two other contestants in the case proposing color systems, and it is a matter of appearance more than anything else. We just think it is a little bit out of order."

[fol. 490] (c) That at the time the device invented by said engineer in the course of his government employment and patented by the Government, was introduced in evidence at the hearing, RCA had full opportunity to object to the continued participation of said engineer in the proceedings but did not do so nor did they raise such an objection at any other time during the hearing or in any of the pleadings or comments filed by RCA with the Commission.

(d) That it raises no genuine issue as to any material fact.

(e) That it has not been alleged by plaintiffs that participation of said engineer in the Commission's consideration of the record in which other engineers on the Commission's staff also participated is in violation of the Administrative Procedure Act, which provides that the provisions of Section 5(c) of that Act (5 U.S.C. 1004 (c)) relating to separation of functions shall apply to agency proceedings pursuant to Section 8 of that Act (5 U. S. C. 1007), but not to rule-making proceedings.

(f) That plaintiffs have made no allegations of bias or prejudice on the part of the Commission.

5. That the further grounds urged by plaintiffs in support of their contention that the Commission's Order adopting the color television standards is illegal, void and beyond the power and jurisdiction of the Commission are as follows:

(a) The Order is contrary to the public interest, convenience and necessity, the basic statutory standard contained in the Communications Act of 1934.

(b) The Order violates Section 303(g) of the Communications Act of 1934.

(c) The Order is unsupported by substantial evidence, is arbitrary and capricious, and is an abuse of discretion.

(d) The Order was adopted before the Commission had discharged its statutory duty to inform itself adequately before issuing a final order in a rule-making proceeding. The Commission wrongfully refused to consider additional evidence of determinative significance to its decision and wrongfully denied the RCA Petition.

(e) The Order is based upon the rejection by the television industry of the two illegal conditions set forth in the first Report.

[fol. 491] (f) The Order is contrary to the terms of the Commission's Notice of July 11, 1949, pursuant to which the hearings on which the Order purports to be based were held.

(g) The Order deprives the plaintiffs of property without due process of law, contrary to the Fifth Amendment to the Constitution of the United States.

6. Affiant submits that Exhibit A is relevant to the above issues sought to be raised and that it shows that the order is within the Commission's authority conferred by the Communications Act of 1934, as amended; that it is based upon a consideration of all the evidence presented to the Commission and supported by substantial evidence; that it is in accordance with the Commission's Notice of July 11, 1949, pursuant to which the hearings on which the Order is based were held; that it is proper and reasonable and in the public interest, convenience and necessity; that it did not deprive plaintiffs of their property without due

process of law; and that there is no genuine issue as to any material fact.

Benedict P. Cottone.

Subscribed and sworn to before me this 27th day of October, 1950. Forest L. McClenning, Notary Public. My commission expires January 15, 1953. (Seal.)

[fols. 491a-492] [File endorsement omitted.]

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[fol. 493] IN THE UNITED STATES DISTRICT COURT

NOTICE—Filed November 14, 1950

The Honorable John Howard McGrath, Attorney General of the United States of America, Department of Justice, Washington, D. C.

Federal Communications Commission, Washington, D. C.

Honorable Otto Kerner, Jr., United States Attorney for the Northern District of Illinois, U. S. Court House, Chicago, Illinois.

Mr. Weymouth Kirkland and Kirkland, Fleming, Green, Martin & Ellis, Attorneys for Plaintiffs, 33 N. LaSalle St., Chicago, Illinois.

Please take notice that on Wednesday, the first day of November, 1950, at the hour of 10 o'clock in the forenoon, or as soon thereafter as counsel may be heard, we shall appear before the Honorable Philip L. Sullivan, United States District Judge, at his Courtroom in the United States Court House, 225 South Clark Street, Chicago, Illinois, or before such other judge of said court as may be hearing matters in his place and stead and shall at said time and place present the motion of Pilot Radio Corporation to intervene as a Plaintiff in the above entitled cause, a copy of said motion together with a copy of the proposed complaint of Pilot Radio Corporation being herewith served upon you, and shall move for the entry of an order granting said motion to intervene and ruling upon the parties in interest, to plead to the complaint of said Pilot Radio Corporation.

At which time and place you may appear if you so see fit.

Mnuchin & Smith, 33 West 42nd Street, New York City, N. Y.; Schapiro and Schiff, 38 S. Dearborn Street, Chicago, Illinois, Attorneys for Applicant for Intervention.

[fols. 494-495] Received a copy of the above and foregoing notice together with a copy of a motion to intervene and of the proposed complaint of Pilot Radio Corporation, this 30th day of October, 1950, before the hour of 4 p. m.

Kirkland, Fleming, Green, Martin & Ellis, by W. K. Otto Kerner, Jr., for

STATE OF ILLINOIS,
County of Cook, ss:

Ann Stritar, being first duly sworn on oath deposes and says that she served the above and foregoing notice together with the copy of motion to intervene and copy of the proposed complaint of Pilot Radio Corporation on John Howard McGrath, Attorney General of the United States of America and Federal Communications Commission by depositing true copies of the same in envelopes addressed to said parties at the respective addresses appearing on said notice, by registering and depositing same in the United States Post Office at Adams and Dearborn Streets, at the hour of approximately 5 PM on Friday, October 27, 1950, postage prepaid.

Ann Stritar.

Subscribed and sworn to before me this 31st day of October, 1950. Lillie A. Love. [Seal]

[fol. 496] UNITED STATES DISTRICT COURT

[Title omitted]

MOTION TO INTERVENE AS A PLAINTIFF—Filed November 14, 1950

To the Judges of the District Court of the United States, for the Northern District of Illinois, Eastern Division:

Pilot Radio Corporation moves to intervene as a plaintiff in the above entitled action on the grounds set forth hereinbelow:

1. Petitioner is a corporation engaged in the manufacture of television receivers and has its principal place of business at 37-06 Thirty-sixth Street, Long Island City 1, New York.

2. The above entitled cause was commenced in this Court by the filing of a complaint on October 17, 1950.

3. Said complaint seeks to have a certain order of the Federal Communications Commission approving the CBS color television system declared null and void and the promulgation, operation and execution thereof restrained [fol. 497] and enjoined.

4. Petitioner is interested in the above entitled action in that it has been adversely affected by said order of the Federal Communications Commission and has suffered and will continue to suffer damage as a result thereof unless said order is enjoined and set aside, all as more fully set forth in petitioner's proposed complaint herein (said complaint being the same complaint heretofore filed by petitioner in the United States District Court for the Eastern District of New York and then withdrawn in order to permit petitioner to intervene herein), a copy of which is attached hereto.

5. Petitioner has the right, conferred by statute of the United States, to intervene in this action; see Communications Act of 1934 as amended (48 Stat. 1064, 1093, 63 Stat. 108; 47 U.S.C. Section 402 (a)) and the provisions of Title 28 of the United States Code relating to suits to set aside and enjoin orders of the Interstate Commerce Commission (28 U.S.C., Sections 2321 to 2325, inclusive).

Pilot Radio Corporation, by Isidor Goldberg, President, Applicant for Intervention. A. L. Schapiro, B. C. Schiff, Schapiro and Schiff, 38 S. Dearborn

Street, Chicago, Illinois. Leon Mnuchin, Jerome S. Zurkow, Mnuchin & Smith, 33 West 42nd St., New York 18, New York, Attorneys for Applicant for Intervention.

[fols. 498-499] *Duly sworn to by Isidor Goldberg, jurat omitted in printing.*

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[fol. 500] [File endorsement omitted]

[fol. 501] IN UNITED STATES DISTRICT COURT

[Title omitted]

INTERVENING COMPLAINT—Filed November 14, 1950

Pilot Radio Corporation, a New York corporation, leave of Court first had and obtained, intervenes in the above entitled cause and for its complaint herein alleges:

1. This is an action to enjoin, set aside, annul and suspend an order of the Federal Communications Commission (hereinafter sometimes referred to as the "Commission") which was issued on or about October 11th, 1950, concurrently with a certain "Second Report of the Commission," for the reasons set forth in said Second Report and in a certain "First Report of the Commission" dated September 1st, 1950. That said Order and said Reports are hereinafter attached as Exhibits A, B and C respectively.

2. This action is brought by Pilot Radio Corporation (hereinafter sometimes referred to as the "intervenor" or the "plaintiff") pursuant to the provisions of the Communications Act of 1934 (48 Stat. 1064, 1093; Code of Laws of the U. S., Title 47, Section 402a), of Title 28 of said Code of Laws of the U. S. relating to the enforcing or setting aside of the orders of the Interstate Commerce Commission (Sections 2321 to 2325 inclusive, of said Title 28), and of Section 2284 of said Title 28 and under the general equitable jurisdiction of this Court.

[fol. 502] 3. Plaintiff, Pilot Radio Corporation, is a corporation organized and existing under the laws of the State of New York, having its principal place of business at 37-06 Thirty-sixth Street, Long Island City 1, New York, in the Eastern District of New York.

4. The Commission is an administrative tribunal created by said Communications Act of 1934 and is charged with the administration and enforcement of said Act.

5. The United States of America is made a defendant in this suit pursuant to the provisions of the said Communications Act of 1934 and of said Title 28, Section 2322.

6. Plaintiff is a corporation engaged in the manufacture of electronic products including television receivers. Plaintiff and its predecessors have been engaged in business since 1919 and plaintiff is one of the pioneers in the field of television. As a manufacturer of television receivers, plaintiff is vitally, and as hereinafter set forth, adversely affected by the said order of the Commission, Exhibit A annexed hereto.

7. The Commission, charged with the administration and enforcement of the Communications Act of 1934, as aforesaid is required, among other things, to encourage a larger and more effective use of radio and perforce television in the public interest. The commission, accordingly, is required to be satisfied that any proposed new system is as good as any system can be expected to be within a reasonable time in the foreseeable future; the Commission must give consideration to improvements in the art of broadcasting and telecasting, protect the public from having [fol. 503] foisted upon its methods of transmission which are insufficiently developed and inadequate, which would lead to useless and unnecessary expenditures by the public and which would render existing receiving sets in the hands of the public useless unless expensive equipment is added thereto, and, in general, in the exercise of the powers and authorities vested in it, act with due regard to whether the public interest, convenience and necessity would be served thereby and in a manner which is not capricious and arbitrary. The Commission in the administration and enforcement of said Act is required to exercise its discretion in a reasonable manner and to base its decisions and orders on good and convincing reasons and substantial evidence, as distinguished from hope and speculation.

8. The said order, Exhibit A, was issued in violation of the requirements alleged in Paragraph 7 hereof, is illegal, void and unreasonable and is beyond the power and authority of the Commission to impose, in that, among other things, it is arbitrary and capricious, contrary to public

interest, and was issued without regard to whether the public interest, convenience of necessity will be served thereby, all for the reasons hereinafter set forth.

9. Notwithstanding the fact that the Commission has no power to regulate or control the manufacture of television receivers, the Commission in its First Report, Exhibit C, sought to achieve such control by threatening the television manufacturing industry, including the plaintiff, that the Commission would approve a color system, namely, that of CBS, which was not yet ready for commercialization and which was far from satisfactory, as hereinafter alleged, [fol. 504] and therefore unacceptable to television manufacturers, unless such manufacturers assured the Commission that they would incorporate in all television receivers to be built certain proposed "bracket standards" which would permit the reception of color transmission in black and white if an incompatible system were thereafter adopted. The terms "bracket standards" and "incompatible system" are defined in said Exhibit C. That said demands were not only unlawful and beyond the authority of the Commission, but they also were arbitrary and unreasonable in that, among other things, they required compliance therewith within time limits which were physically impossible to meet, all of which was known to and ignored by, the Commission.

10. That upon the failure of the television industry to give the aforesaid demanded assurances and in pursuance of its aforesaid threats, the Commission issued the said order, Exhibit A.

11. That said CBS system was approved by the Commission although it conceded that further testing and more information was required with respect to essential factors pertaining thereto.

12. The approval by the Commission of the CBS color television system was expressly predicated by the Commission upon hope and speculation and the ephemeral belief that further experimentation and possible improvements would subsequently justify the Commission's decision, and notwithstanding the fact that the Commission had found said CBS system inadequate and unsatisfactory as measured by the Commission's own criteria.

13. The CBS color television system approved by the Commission, as aforesaid, is substantially the same system which had been disapproved by the Commission in its report

dated March 18th, 1947, a copy of which is hereto annexed [fol. 505] as Exhibit D, and the reasons for such disapproval are still applicable.

14. The said CBS system, as the Commission recognized in said Reports, is not usable in connection with television receivers with a tube larger than 12½ inches, although the trend of the public is to purchase sets which are larger than 12½ inches. Despite the progress of the television industry to, and the demand by the public for, larger type receivers the Commission is seeking to enforce a regression of standards and to foist upon the public an inferior size of television receiver.

15. Television receivers are incapable of any reception of the CBS color transmission unless there is added to said sets an adapter, in order to provide reception of black and white on the CBS color transmission, plus a converter in order to receive color on the CBS color transmissions. By reason thereof, the Commission has rendered all existing television receivers obsolescent and completely us-less unless there is added the aforesaid adapter in order to receive such transmission in black and white plus a converter if colored reception is desired.

16. The CBS system was approved by the Commission, as aforesaid, even though the Commission found that black and white reception of the CBS transmission is inferior to present monochrome standards. The term "monochrome standards" is defined in Exhibit C.

17. The Commission, in its said Reports, Exhibits B and C, expressly recognized that there are current significant developments and improvements in the field of color television which could render said CBS system archaic and inferior and any order approving such system contrary to public interest. Nevertheless, the Commission arbitrarily [fol. 506] refused to permit further and sufficient time for study and demonstration of such developments and improvements.

18. The said order of the Commission, Exhibit A, is not predicated upon the fact that the said CBS system is as good as can be expected within a reasonable time in the foreseeable future.

19. The Commission, in presently approving a system which it had found far from satisfactory, alleged as the

reason therefor fear that the problem of incompatibility would be aggravated by further delay in that the number of black and white receivers in the hands of the public would continue to grow so that should an incompatible system be eventually adopted, more sets would require external adapters. Said alleged basis for the issuance of said order, Exhibit A, is untenable and without foundation in fact, inasmuch as there is no appreciable difference between the cost of an external adapter and the increased cost of building new sets for internal adapters. The approval of the CBS color transmission system, without proper foundation therefor, as herein alledge, will accordingly, unless enjoined and annulled, as herein prayed for, impose upon the public useless and unnecessary expenditures for external and internal adapters and like expenditures by the public for converters and furthermore, will compel the television manufacturing industry, including the plaintiff, to revamp its production facilities, methods and practices, at considerable trouble and expense, as hereinafter alleged in Paragraph 22 of this Complaint, all of which is useless and unnecessary and not in the public interest.

20. By the terms of the said order, Exhibit A, the same will become effective on November 20th, 1950, unless en- [fol. 507] forcement thereof is stayed, suspended or annulled pursuant to the prayer for relief stated herein.

21. Said order, Exhibit A, already has worked and will continue to work irreparable damage and injury upon plaintiff in the conduct of its business, as hereinafter alleged.

22. The plant and facilities of the plaintiff are designed and set up for the production of television receivers capable only of receiving under the present monochrom- system and plaintiff has a substantial investment therein. In order to manufacture sets capable of receiving the CBS color transmission, it is necessary for plaintiff to disrupt its present production, to redesign and retool its equipment and facilities, and to re-train its personnel, all of which will involve a substantial outlay of money and effort and will place a severe burden and hardship on the plaintiff.

23. Plaintiff has completed and has on hand and in process of manufacture sets capable of receiving black and white transmission only and dealers and representatives of

the plaintiff have on hand like sets of plaintiff's manufacture for sale to the public.

24. Upon the publication of said order of the Commission, Exhibit A, on or about October 11th, 1950, and as a result thereof, plaintiff began to receive and has continued to receive cancellations of previously placed orders for its black and white television receivers, and the normal amount of new orders for its said type of television receivers has already been sharply reduced. Likewise, as a result of said order, plaintiff's said dealers have already received a large number of cancellations from customers who had placed orders for plaintiff's said sets, and new retail purchases [fol. 508] thereof have likewise been reduced. Plaintiff and its dealers find themselves burdened with a large stock of black and white television sets which have been rendered unsaleable as a result of said order and the conditions herein alleged are becoming and will become progressively worse. The resultant financial loss to plaintiff and its dealers has been considerable and will increase, and plaintiff's loss of good will and reputation, achieved after upwards of thirty-one years in the field of electronic production, will be irreparable, as hereinafter alleged.

25. Unless the order of the Commission, Exhibit A, is set aside and voided as herein requested, plaintiff, in order to continue in business will be compelled to manufacture television receivers capable of receiving CBS color transmission despite the inadequacies, limitations and deficiencies of the CBS color system, and despite the arbitrary and capricious nature of the Commission's order approving the CBS system, and despite the impending developments and improvements which the Commission refused to consider, and which could result in an early discarding of the CBS color system and an early rendering of sets designed to receive CBS color transmission obsolete, all as herein alleged.

26. Plaintiff, as a manufacturer, is dependent upon the good will of the public and its acceptance of plaintiff's product. A sale by the plaintiff of television receivers constitutes, in effect, a representation to the public that such sets are perfected, and an assurance that the same will be of continuous use and service for reasonable duration. In reliance upon such representation and assurance the public pays a substantial price for each television receiver, which,

amortized over the useful life of the television receiver, is reasonable and not excessive, but which would be wasteful and excessive if such television set were rendered obsolete in the near future.

[fol. 509] 27. By reason of the deficiencies and limitation of the CBS color system, as hereinabove alleged, any receivers to be manufactured by plaintiff capable of receiving the CBS color transmission will necessarily suffer from the same deficiencies and limitations and, further, will be subject to early obsolescence in the event current developments and improvements lead to the adoption of a color system different from that of CBS.

28. By reason of the premises, plaintiff will suffer irreparable damage to its good will and reputation.

29. Prior to the adoption of the said order, Exhibit A, plaintiff submitted to the Commission its objections to its proposed order, a copy of said objections being hereto attached as Exhibit E, but that the Commission wholly disregarded the same. The reasons and arguments advanced in said Exhibit E are reiterated and realleged herein as further bases for plaintiff's claim to relief.

30. By reason of the foregoing, plaintiff is suffering, and unless the said order, Exhibit A, be enjoined and suspended, will continue to suffer substantial and irreparable harm to its business, good will and reputation. That no adequate remedy at law exists except by this action.

Wherefore, intervenor prays.

(a) That the specially constituted Court of three judges convened to hear this matter issue a temporary or interlocutory injunction herein restraining, enjoining and suspending until the further order of this Court, the operation, execution and enforcement of the said order of the Commission, Exhibit A.

[fol. 510] (b) That after a final hearing, this Court adjudge order and decree that the said order, Exhibit A, was at all times beyond the lawful authority of the Commission, in violation of the legal rights of the plaintiff, wholly void, arbitrary and unreasonable and that said order be perpetually vacated, set aside, suspended and annulled, and the enforcement thereof perpetually restrained and enjoined.

(c) That the intervenor have such other and further relief in the premises as to this Court may appear just and proper under the circumstances.

Mnuchin & Smith, Office & P. O. Address: 33 West 42nd Street, Borough of Manhattan, City of New York, by Harry K. Smith, A Member of the Firm. Schapiro & Schiff, Office & P. O. Address: 38 S. Dearborn Street, Chicago, Illinois, by B. E. Schiff, A Member of the Firm; Attorneys for Intervenor.

[fols. 511-518] *Duly sworn to by Isidor Goldberg. Jurat omitted in printing.*

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[fols. 519-522] EXHIBIT "A"

Omitted. See exhibit "H". Printed side page. 409 ante.

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[fols. 523-538] EXHIBIT "B"

Omitted. See exhibit "G". Printed side page. 443 ante.

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[fols. 539-721] EXHIBIT "C"

Omitted. See exhibit "B". Printed side page. 107 ante.

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[fol. 722] EXHIBIT "D" TO INTERVENING COMPLAINT

Federal Communications Commission
Washington 25, D. C.

Docket No. 7896

In the Matter of Petition of COLUMBIA BROADCASTING SYSTEM, INC., for Changes in Rules and Standards of Good Engineering Practice Concerning Television Broadcast Stations

Report of the Commission

(Adopted March 18, 1947)

I

This proceeding arises upon the petition of Columbia Broadcasting System, filed on September 27, 1946, request-

ing the Commission to authorize the operation of commercial color television stations in the frequency band 480 to 920 megacycles and to amend its Standards of Good Engineering Practice Concerning Television Broadcast Stations in specified particulars so as to permit operation of color television stations on the basis of the system developed by Columbia. The portion of the radio spectrum to which the petition refers—480 to 920 megacycles—is at the present time allocated for experimental purposes in connection with television systems. Provision for television operation on a regular basis is made on Channels 1 to 13 which range from 44 to 216 megacycles; only black and white television pictures are transmitted on these channels. No change is proposed by Columbia with respect to television broadcasting on Channels 1 to 13.

In brief, the color television system proposed by Columbia provides for channels 16 megacycles wide, with color being transmitted sequentially. Under the proposed sequential system, each picture is scanned through separate color filters—red, green and blue, in turn. These transmissions in the separate colors follow each other at the rate of 48 times per second. These three color transmissions are accepted by the receiver by means of a color wheel containing filters of red, green and blue, which rotates in front of the television screen in synchronism with a similar color wheel at the transmitter. When the images of the three colors are so received, the eye is enabled to see the picture in full color.

It should be pointed out that the only color television system as to which Commission approval is requested in this proceeding is that proposed by Columbia. During the hearing Radio Corporation of America demonstrated another color television system. This is the so-called simultaneous system where each picture is scanned simultaneously in three colors—red, green and blue—and these transmissions [fol. 722] are sent simultaneously on three different channels and are combined at the receiver to produce a color image. Radio Corporation of America did not advance this system as one which should be approved at this time. R. C. A. stated that its system was still in the laboratory stage but presented it to the Commission as representing a system which could be developed for commercial use in four or five years and which, according to R. C. A. has many advantages over the sequential system.

Columbia requested that a hearing be held by the Commission on its petition so that it and other interested parties might present testimony of expert witnesses with respect to the matters in issue. Accordingly, the Commission on October 9, 1946 designated the petition for hearing. Hearings were held in Washington on December 9 through 13, 1946, in New York City on January 27 and 28, 1947, in Princeton, New Jersey, on January 29 and again in Washington on February 10 through 13, 1947. The hearings in New York and Princeton were for the purpose of permitting Columbia and the other parties to demonstrate their systems for the record.

Before proceeding to a consideration of the petition and the evidence adduced at the hearing, a brief discussion appears appropriate as to the necessity for Commission approval of standards. The question may be asked as to why, if Columbia has a system of color television which it believes is ready, and frequencies are available, it cannot offer its system to the public and let its competitors do the same thing with respect to their systems. The public would then decide which system, if any, it prefers. The point might be made that this is the way things are done if, for example, a company desires to bring out a new car, washing machine, or vacuum cleaner.

The answer lies in the nature of television and the fact that there are not enough frequencies available in the 480 to 920 megacycle band for more than one color television system. In television the receiver and transmitter are in effect components of one integrated system, or, expressed in another manner, the transmitter and receiver are related to each other as a lock and key. Unless they are both designed to meet certain fundamental standards, the receiver will be unable to accept the transmissions from the transmitter. For example, let us consider the method of transmitting the color. The method proposed by Columbia is the sequential method. R. C. A. has proposed as an alternative the simultaneous method. Still other possibilities exist. Receivers that are built for the sequential system would not be able to receive programs from television stations broadcasting on a simultaneous system or on another system.

The method of transmitting color is only one of the many fundamental standards that have to be fixed. In addition, mention might be made of number of lines, frame rate, type

of sound system, etc. In all of these cases, the receiver must be constructed to the same standards as the transmitter if they are to be able to receive the programs. If at any [fol. 724] time a broadcast company should change any one of the above standards, all the receivers which it previously serviced would immediately become useless. Unlike the automobile or vacuum cleaner which remains capable of operation after a new model is brought out, a change in any one of the fundamental standards at the transmitter would immediately make all receivers built for the old standards obsolete.

Thus, it is obvious that before permitting a new television service to become established on a regular basis, a decision must first be made on fundamental standards. Otherwise, manufacturers of receivers could not start to build receivers, and the public could not purchase receivers with any confidence that they would be able to receive programs from all television stations, or that their receivers would not become useless immediately after they were purchased if the existing stations should change any of the fundamental standards. Under these conditions, it is entirely unlikely that television receivers would be bought on any mass basis. The justification for allocating so much of the radio spectrum to television broadcasting—78 megacycles for Channels 1-13 and 440 megacycles for experimental television—is that television is an important medium for bringing news, education, culture and entertainment to large segments of the population. With the great demand for frequencies on the part of the other radio services which cannot be met in full, the Commission would not feel justified in allocating so many frequencies to television at the expense of the other radio services, if it were inevitably destined to be limited to small audiences.

Before approving proposed standards, the Commission must be satisfied not only that the system proposed will work, but also that the system is as good as can be expected within any reasonable time in the foreseeable future. In addition, the system should be capable of permitting incorporation of better performance characteristics without requiring a change in fundamental standards. Otherwise, the danger exists that the standards will be set before fundamental developments have been made, with the result that the public would be saddled with an inferior service, if the new changes were not adopted, or if they were adopted,

receivers already in the hands of the public would be rendered useless.

Judged by the foregoing test, the Commission is of the view that the standards for color television proposed by Columbia Broadcasting System should not be adopted. In the commission's opinion the evidence does not show that they represent the optimum performance which may be expected of a color television system within a reasonable time. The Commission bases this conclusion on two grounds. In the first place, the Commission believes that there has not been adequate field testing of the system for the Commission to be able to proceed with confidence that the system will work adequately in practice. Secondly, the Commission is of the opinion that there may be other systems of transmitting color which offer the possibility of cheaper receivers and narrower band widths that have not yet been fully explored. Both grounds will be discussed in greater detail further on in the report.

[fol. 725] II

Before approving a new system of television it is indispensable that there be an adequate program of field testing. Receivers and transmitters must be subjected to numerous tests over a long period of time and at a diversified set of locations and operating conditions so that operation under average home conditions is closely approximated. Without such field testing, there is no assurance that all fundamental defects have been eliminated. There is a great difference between the performance of a system in a laboratory with trained personnel and its operation in the home by the average citizen. In the history of electronics there have been developments which looked promising in theory and even in operation in the laboratory but which revealed such fundamental defects when subjected to adequate field testing that they had to be abandoned entirely.

The record in this case discloses that while Columbia has done an extensive amount of testing of its system, most of it has been in the laboratory or under controlled conditions. No extensive testing under widely varying circumstances has been attempted. For example, all experimentation has been confined to one station in New York City. Furthermore, from the record it does not appear that at any time have there been more than 15 receivers in operation and all

of those were in the hands of Columbia. In this connection, it might be pointed out that before standards were adopted for monochrome television, there were at least seven stations in operation in several cities and several thousand television receivers were outstanding, a good part of them in the hands of members of the public.

The Commission does not take the position that adequate field testing necessarily requires a large number of receivers. Much can be done with a relatively small number of receivers if they are tried out under sufficiently diverse conditions. However, as the following discussion will show, no such tests have been made. The Commission's insistence on adequate field testing is not based merely on the theoretical desirability of such testing or the fact that field testing in the past has disclosed fundamental defects in other systems. On the contrary, the discussion that follows shows that on many important matters as to which a decision must be made before standards can be adopted, there is insufficient evidence upon which the Commission can base a decision. In the Commission's opinion, more field testing is necessary before sufficient evidence exists upon which a decision can be premised.

(1) *Picture brightness and contrast*—The brightness with which a picture can be produced on a television screen is one of the most important performance characteristics of a television receiver. If inadequate brilliance is produced, the house must be darkened in much the same way as a movie theatre in order to be able to see the picture. This seriously restricts the usefulness of television in the home because most people will find it very difficult to make their rooms sufficiently dark during the daytime for satis- [fol. 726] factory viewing under these conditions and quite inconvenient to black out their homes at night. Hence, it is important that receivers be developed which are capable of operating satisfactorily in rooms with normal illumination.

Dr. Peter C. Goldmark, testifying for Columbia Broadcasting System, stated that Columbia had developed a receiver in its laboratory which was capable of producing 22

foot lamberts of illumination.[1] However, at the hearing in New York, none of its receivers developed more than 15 foot lamberts. In contrast, Allen B. DuMont Laboratories, Inc., demonstrated black and white direct-view receivers that produced an average highlight brightness as high as 750 foot lamberts and Philco Radio Corporation displayed a projection type of receiver which produced an average highlight brightness of approximately 35 foot lamberts.

Dr. Goldmark testified that these differences in brightness were not significant because in his opinion the brightness of the Columbia picture was adequate and that the added brightness was, therefore, not necessary. Moreover, according to Dr. Goldmark, once adequate brightness has been provided for, it is more important to concentrate on contrast in the picture than on added brightness. By "contrast", Dr. Goldmark refers to the relative difference between the whitest white and blackest black in a picture. According to Dr. Goldmark, a ratio of at least 30 to 1 in contrast is needed if a satisfactory picture is to be produced.

To illustrate the point, let us assume that in a given room 10 foot lamberts are reflected from the television screen as a result of ambient light. In order to have a contrast ratio of 30 to 1 the receiver must be capable of producing a highlight brightness of 300 foot lamberts. In the case of the Columbia receiver, no such problem is involved according to Dr. Goldmark. This is because the color filter in front of the television screen absorbs much of the ambient light. The filter presently in use transmits 10% of the light. Hence, if the ambient illumination is 10 foot lamberts, the filter permits only 1 foot lambert to penetrate through to the screen and this in turn in being reflected is reduced to 0.1 foot lamberts as it passes through the filter a second time. In order to give a contrast ratio of 30 to 1 the receiver should be capable of producing a highlight brightness of 3 foot lamberts.

[fol. 727] In answer, expert witnesses for DuMont and

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[1]A foot lambert is the unit for measuring the brightness factor of light reflected from a surface. One foot lambert represents the brightness of one foot candle of illumination reflected from a perfectly reflecting surface.

other companies testified that in their opinion the brightness of the Columbia picture was not adequate for home use. Dr. Goldmark maintained that it was adequate and that any greater brightness would be uncomfortable to the eyes.

The demonstration was not an effective medium for resolving this conflict in testimony. The hearing room where the demonstrations took place was, of necessity, a large room and hence it was difficult to approximate home conditions. The distances and angles at which the pictures were viewed were such as would normally not be found in the average home. Moreover, the room had overhead lights suspended on chandeliers which caused annoying reflections from the face of the receiver. Such lights would usually not be found in a home. Reflections also were apparent from large windows on the side of the hearing room.

However, it should be pointed out that there was no evidence presented as to what the situation would be under home conditions. Indeed, since Columbia has not tested its sets in homes, such evidence was not available. The Commission is of the opinion that on a question as to just how much brightness is necessary for home viewing under normal ambient lighting conditions, there is no substitute for actual tests in homes under a wide variety of circumstances. It is not possible to theorize on what the public will find to be generally acceptable. Adequate tests must be made at numerous home receiving locations. In many homes, the space is so arranged that lights from windows or from lamps or overhead lights will, unavoidably, fall directly on the face of the receiver, being just as bad or worse than the conditions in the hearing room. Moreover, receivers will undoubtedly be placed in public places, such as auditoriums, hotel lobbies, etc. Tests should cover this type of situation as well as more ideal test situations. Until a sufficient number of tests has been made, the Commission is unable to conclude that the brightness of the Columbia picture is adequate for home use.

(2) *Flicker*—Equally as important and closely related to the problem of brightness is flicker. The presence of flicker on the television screen as on the motion picture screen is tiring on the eyes and is a serious obstacle to enjoyable viewing. In the case of television as in the case of motion pictures, an increase in brightness of the picture (without an increase in frame rate) accentuates observable flicker.

It is this factor which operates as a serious stumbling block in the path of increasing the brightness of the Columbia picture.

There is not agreement on the record as to whether there would be any flicker in the Columbia picture if a brightness of 20 foot lamberts is achieved. However, as the brightness is increased, and the frame rate remains constant, there would no doubt be an increased tendency to flicker. Columbia witnesses were in disagreement with the witnesses of other companies concerning the point at which such flicker becomes noticeable or objectionable. However, even if we [fol. 728] use the testimony of Columbia's own witnesses, flicker becomes apparent (i.e. "threshhold flicker") at 23 foot lamberts and begins to be objectionable (i.e. "maximum tolerable flicker") at 52 foot lamberts.[2] As has already been pointed out, on the basis of the evidence before the Commission, there is no real assurance that greater brightness is unnecessary for normal home viewing conditions.

Moreover, there are several factors concerning the tests upon which the Columbia testimony is based which severely minimize their value. In the first place, these tests were conducted with a relatively small group of persons. In addition, all of these persons were not only employees of Columbia but in addition were employed in the very department which has responsibility for the development of color television. Finally, even these tests showed that there was a great difference of opinion among individual observers as to what constituted perceptible flicker. The results given by Columbia are based on median values. The Commission is of the opinion that in a field where such subjective elements as "threshhold flicker" and maximum tolerable flicker" are being tested, there are no shortcuts. If the results of the tests are to be given any weight, they must be made with disinterested persons and a sufficient number must be chosen at random so that there is reasonable assurance that the results are satisfactory not merely to 50% of the people but to the great majority of viewers.

A second limiting factor applicable to the Columbia tests arises from the fact that they are based on a viewing ratio

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[2] As will be pointed out later, these figures are based on the use of so-called low flicker primaries.

of 7 to 1; that is, the observers were seated at a distance from the receiver that was seven times as much as the height of the picture. Other witnesses testified that the optimum viewing distance was 4 to 1. It is well known that the tendency to observe flicker increases as one draws closer to the receiver and decreases as one draws farther away. It is obvious that in many homes not all of the television viewers will be able to sit at a 7 to 1 distance from the receiver. In the case of a picture 10 inches high, a 7 to 1 ratio is 70 inches—which appears to be practicable for most living rooms. If a receiver were employed with a picture 18 inches high—as is true of some present day monochrome receivers—an observer would have to be 126 inches from the receiver—or 10½ feet. It is not reasonable to expect that living rooms will be arranged for the television set only; consideration in placing furniture in the home must also be given to livability and comfort. Many home owners will undoubtedly find it impossible to place their receiver in the best possible position for viewing. Since this is so, the Commission in setting standards for color television must make it possible for the system to be used in the average home and under normal circumstances.

[fol. 729] A third factor that should be mentioned relates to the particular color primaries used. It is possible to utilize several different combinations of values of the primary colors—red, green and blue—in color television. Originally Columbia used a set of color primaries which in the record is referred to as "Color Primaries B". At the present time, it is utilizing a set of primaries referred to as "Color Primaries A". There is no dispute on the record that Color Primaries B give a more faithful reproduction of colors than Color Primaries A. Columbia has decided to utilize Color Primaries A because these are the so-called low-flicker primaries. In other words, by utilizing Color Primaries A, it is possible to increase the brightness of pictures to a higher value without increasing the susceptibility to flicker.

An answer to this problem of brightness and flicker might be found in a higher frame rate; with a higher frame rate additional brightness is possible without flicker: The difficulty with this solution is that Columbia has specifically stated that it is opposed to a higher frame rate. Moreover, an increase in frame rate creates other problems which will be discussed in the next section.

Another possible solution was suggested by Dr. Goldmark. He testified that it was possible to increase brightness without changing the frame rate and still avoid flicker. This could be done, he stated, by employing tubes with a slow decay phosphor. Dr. Goldmark admitted that such tubes have not yet been developed. Moreover, R. C. A. testified that it had experimented with such tubes and had found them to be very complicated. Witnesses for DuMont testified that that company had also conducted experiments with tubes having slow decay phosphor but found them objectionable. Apparently such tubes resulted in objectionable trails being left on the face of the tube. It is not possible to resolve this dispute until tubes of the type described by Dr. Goldmark are in fact developed and are sufficiently field tested so that it can be stated with assurance that they will work satisfactorily.

In summary, the Commission is unable to conclude from the evidence that the brightness of the Columbia picture is adequate for home use under normal circumstances or that it can achieve such brightness without encountering objectionable flicker. In the absence of more convincing evidence on the point, the Commission is of the opinion that on the point of brightness and flicker alone, the risk of approving the Columbia standards at this time is that color television might be forced to limp along with a picture that is not sufficiently bright for general home use or is subject to objectional flicker.

[fol. 730] (3) *Frame rate.*[3]—As has been pointed out,

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[3] During the course of the hearing, the expression "frame rate" was used in several different meanings. Sometimes it meant the number of times per second that the picture area is scanned once in each of the three primary colors. This is more accurately described as "color frame frequency". At other times, "frame rate" was used in the same sense as in the motion picture industry. As so used it means the number of times per second that each individual picture is seen in all of the colors; this is the meaning that is employed in this Report. The difference between the two concepts arises from the fact that in television, as in the motion pictures, each picture is shown twice during the course of each frame. Hence, "frame rate" is half of the "color frame frequency". In monochrome television the frame rate is 30 per second.

frame rate is closely related to the problem of both brightness and flicker. In general, the higher the frame rate, the brighter the picture can be without flicker. On the other hand, the higher the frame rate the wider must be the television channel. Thus, an accommodation must be made between a high enough frame rate to give adequate brightness while at the same time not being so high as to involve the use of so wide a channel as would constitute the wasteful use of radio spectrum.

Until fairly recently, Columbia employed a frame rate of 20 per second. This was clearly inadequate as on Columbia's own testimony this would permit a picture brightness of only approximately 5 foot lamberts before flicker became noticeable and slightly more than 11 foot lamberts before the flicker became objectionable. Both of these figures are based on the use of the low flicker primaries A. In the instant petition Columbia has proposed a frame rate of 24 per second. While this increase permits a brighter picture than was possible with a frame rate of 20, there is considerable doubt, as has already been pointed out, as to whether the brightness which results is adequate.

Columbia's petition does not request an increase in frame rate beyond 24 per second. On the contrary, Columbia made it clear at the hearing that it did not desire any such increase. A further increase in frame rate is, of course, possible, but there are several objections to doing so under the Columbia system.

In the first place, an increase in frame rate would mean additional channel width. Since the Columbia proposal already requests a band width of 16 megacycles, any further widening of the band is to be avoided if at all possible. The wider the band, the fewer television channels that can be accommodated. With 16 megacycle channels, only 27 television channels can be provided for between 480 and 920 megacycles. There is some doubt as to whether this number is adequate to provide a truly nationwide competitive television system. Any diminution in the number of available channels will make the task even more difficult. Moreover, at the hearing in Princeton, R.C.A. demonstrated a simultaneous television system which employed a frame rate of 30 per second and yet could be accommodated within a 12.5 megacycle band. While this system is as yet too untested to be able to predict whether it will prove to be practicable, or whether it results in degrading television

[fol. 731]

performance, the combination of a higher frame rate with narrower band width which the system proposes is a development that is highly desirable and should be fully explored.

In the second place, an increase in frame rate poses some very difficult mechanical problems. The higher the frame rate, the faster must be the revolution of the mechanical color wheel. An increase in frame rate from 24 to 30 per second would require an equivalent increase in the speed of the color wheel from 1440 revolutions per minute to 1800 revolutions per minute.[4] If this increase is added to an increase in the size of the color wheel which is necessary to make possible larger direct-viewing screens, some very real mechanical and noise problems are introduced.

(4) *Color Breakup.*—One of the points which the opponents of the sequential color system make is that since the appearance of color is produced by a rapid alternation of the three primary colors, the color in the picture has a tendency to break up under certain circumstances. They suggest that a practical test for determining whether there is such breakup is to move the head vigorously from side to side while looking at the picture or to move the hand vigorously in front of the eyes while viewing the picture. Dr. Goldmark replied that it is not normal procedure for people in their homes to go through such antics in looking at a television picture.

The opponents, however, make the point that even without such antics, color breakup becomes apparent if a fast moving object is shown on the screen. During the demonstration in New York, the observers associated with those companies opposing the Columbia proposal stated that color breakup was apparent, while observers associated with Columbia stated that there was no color breakup. As has already been stated, the hearing room was not an effective place for proving or disproving this point. In the Commission's opinion, the question of whether there is or is not color breakup is a matter to be determined by the individual viewer and hence there is no substitute for testing the system in a representative number of homes under normal conditions where programs of a wide variety of subjects are presented over a fairly long period of time. Only in this

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[4] These figures are based upon the use of a color wheel containing two segments of each color primary.

way, can there be any assurance that the general public will or will not be able to observe color breakup.

[fol. 732] (5) *Receiver design.*—The inadequacy of field tests, in general, of the Columbia receivers has already been referred to. There are, however, several special matters concerning the need for tests of receivers that should be mentioned.

At the hearing Columbia demonstrated a receiver with a 7-inch direct viewing tube. A lens with magnifying characteristics was used in front of the tube so as to give an apparent size of a 10-inch screen. This lens, however, has since been discarded by Columbia because it is subject to specular reflection from lights and windows and severely restricts the viewing angle at which the picture can be seen.

It is obvious that color television will not be wholly satisfactory unless larger viewing screens can be built. At the present time there are 20-inch direct viewing tubes for monochrome television. Incorporating a viewing tube of that dimension into the Columbia color television system involves some difficult problems. With a 7-inch viewing tube the mechanical color wheel has a diameter of approximately 16 inches. For a 20-inch tube the diameter would be 42 inches. This would impose severe limitations on receiver cabinet design. Furthermore, as has already been pointed out, problems are involved in rotating such a disc at 1440 revolutions per minute without causing unpleasant noise. Even if the viewing tube were 15 inches, the rotating disc would have a diameter of 32 inches, which still presents many difficult problems.

At the hearing, Dr. Goldmark testified that the color wheel was not an integral part of the sequential system. In his opinion, color can be produced under a sequential system by employing three different tubes each one coated with a special slow decay phosphor that is sensitive to only one of the three primary colors. The difficulty with the use of such tubes has already been adverted to. In the first place, no such system has yet been built or field tested. Secondly, witnesses for DuMont testified that that company had made tests with slow decay phosphor tubes but had found them objectionable. Unless or until a system which has the 3-tube system is constructed and field tested, there is no assurance that it will work successfully. The Commission, therefore, cannot assume with any degree of assurance that the

Columbia system is not limited to the color wheel with the severe restrictions it imposes on picture size in a direct viewing receiver.

Larger pictures, of course, can be produced by means of a projection receiver. On this point, Columbia testified that it had built such receivers in the past but at the present time had no such set available. Moreover, it is well known that projection receivers are incapable of producing as bright a picture as a direct view receiver and reference has already been made to the serious doubts concerning the adequacy of the brightness of the Columbia direct view receiver. In the case of the projection receiver this problem would be aggravated.

[fol. 733] The conclusion is inescapable that further field testing of receivers is indispensable before standards can be approved.

(6) *Design of other equipment.*—No transmitter has yet been built which will operate in the upper part of the 480 to 920 megacycle band. Receiving antennas of fairly complex design have been built and tried out to some degree; apparently, the standard form of antenna will not be adequate for good reception in this band. Additional tests of the antennas should therefore be made.

So far as studio and pickup equipment is concerned, Columbia stated that it has built an image orthicon camera and has pointed it out the window for outdoor pickups. It should be noted that no attempt was made to demonstrate this equipment at the hearing. Moreover, Columbia admitted that it has not used this equipment to televise sporting events or any outdoor special events.

## III

In addition to the question of field testing, the Commission is of the view that further experimentation is necessary in the color television field. From a consideration of the Columbia petition and the evidence adduced at the hearing it is evident that the Columbia system is in effect the present monochrome television system with color added. While the present system affords an adequate black and white service to the public, the fact remains that it was developed and standardized before the extensive developments in electronics that took place during the war. It is quite possible that as a result of wartime discoveries, improvements

can be made, for example, in picture detail, picture sharpness, a simpler and more-effective synchronization system, a better sound system, etc. Furthermore, wartime developments may show that there is an entirely different method from either the sequential or simultaneous system which is superior to both. Before standardizing television in the upper band, we should be sure that all of the wartime electronic developments have been explored to determine whether they can be applied to the advantage of television. The wartime security precautions have been lifted so recently that much of the vital information developed during the war probably has not seeped down to all elements of the industry working on television problems. The effect of these wartime developments cannot be fully felt until there has been this widespread dissemination of information.

Two specific problems, in the Commission's opinion, should be carefully examined. In the first place, there should be further experimentation looking towards the development of low cost television receivers. A large portion of the radio spectrum has been allocated for television, [fol. 734] The demand for space in the spectrum from other radio services is very keen and it is not possible to satisfy all requests. The objective of television heretofore mentioned of bringing news, education, culture and entertainment to large numbers of people cannot be carried out unless television receivers are manufactured and sold at a price which the average family can afford to pay.

Secondly, further experimentation should be conducted along the line of finding methods of transmitting color television over narrower channels. Under the Columbia proposals, each television channel would be 16 megacycles wide. That means that the band 480 to 920 megacycles would accommodate but 27 channels. It was the Commission's hope in allocating the band 480 to 920 megacycles for television that in this band it would be possible to provide for a truly nationwide competitive television system. The evidence before the Commission shows that 27 channels may not ultimately be enough to provide for a truly nationwide competitive television system. Every effort must, therefore, be made to narrow the band width required for color television. It should be emphasized that narrowing the band width should not be at the expense of picture brightness, picture detail, color fidelity, or other features

of television performance. The objective should be a narrower band width while retaining and even improving the quality of television performance.

At the hearing there was much testimony concerning the desirability of a system which would permit present television receivers, simply by adding a convertor, to receive in monochrome, the broadcasts of stations broadcasting color programs in the 480 to 920 megacycle band. This so-called principle of compatibility, it is urged, will encourage manufacturers of black and white equipment to proceed at full pace, will enable the public to buy receivers with confidence that they will not be rendered obsolete, and will not impede the development of color television. The Commission is of the opinion that compatibility is an element to be considered, but that of greater importance, if a choice must be made, is the development of the best possible system, employing the narrowest possible band width, and which makes possible receivers capable of good performance at a reasonable price.

[fol. 735] IV

The Commission is of the opinion for the reasons Broadcasting System should be denied. In reaching this decision, the Commission does not desire to minimize in any way the advances that have been made in the development of color television. On the contrary, the Commission is of the opinion that Columbia Broadcasting System, Dr. Goldmark and the people who have worked under him are to be commended for their continuing interest in the field and for the great strides that they have made in this field in so short a period. The Commission, however, cannot escape the conclusion that many of the fundamentals of a color television system have not been adequately field tested and that need exists for further experimentation along the lines noted above. It is hoped that all persons with a true interest in the future of color television will continue their experimentation in this field in the hope that a satisfactory system can be developed and demonstrated at the earliest possible date.

[fol. 736] EXHIBIT "E" TO INTERVENING COMPLAINT

Tel.: Stilwell 4-3036-7, Stillwell 4-5455-6-7-8. Cable Address, Pilotradio, New York.

PILOT RADIO CORPORATION

Manufacturers of Radio and Television Apparatus

37-06 Thirty-Sixth Street,
Long Island City 1, New York, U.S.A.

September 27th, 1950.

Federal Communications Commission, Washington, D. C.

GENTLEMEN:

Pilot Radio Corporation is a manufacturer of television receivers and as such is vitally interested in and affected by your report on color television issues, adopted September 1, 1950, and your concurrently issued notice of proposed rule making. Accordingly, and in response to the invitation extended therein to television manufacturers, we are herewith submitting our views and comments.

At the outset, we must point out that it is physically impossible to build sets capable of operating within the proposed brackets, commencing with the effective date of the adoption of the proposed order, i.e., some time in November, 1950, as requested by you. This was the unanimous view of the engineering representatives of the television industry expressed at a meeting of Panel 5 of the NTSC held on September 13, 1950. Estimates there presented of the earliest date on which such sets could be built ranged from April 1951 to February 1952. For that reason alone, we cannot give you the assurance you ask. In addition, we find your proposal unacceptable for a variety of other pertinent considerations.

Your proposal regarding bracket standards is inextricably tied in with your determination on the CBS color system. Recognizing, as you must, that you lack the power to regulate or control the manufacture of television receivers, you have made no separate and independent demand upon the industry to incorporate the proposed bracket standards in television receivers. The demand is, ostensibly presented as an alternative. You seek thereby to accomplish indirectly what you cannot do directly. Thus

you threaten that unless we comply with your "request", you will immediately approve a color system, viz, that of CBS, which is not yet ready for commercialization and which you yourself have admitted is far from satisfactory and therefore unacceptable to television manufacturers. If we accede to your demand, you offer us an illusory reward: you will postpone your decision as to color to afford time to explore the matter more fully. We say "illusory" because, as we shall hereinafter discuss, the time which you propose to allot for further demonstration and development is wholly inadequate even when judged by your own criteria.

[fol. 737] This is a choice without real alternative, and is bound to cause incalculable harm to the general public as well as to the large and growing television industry. You are asking manufacturers to spend substantial amounts of money and effort in putting additional apparatus in television sets, which will necessarily result in increased costs to the public, even though the same is not intended for present use and will ultimately be discarded, if, as a result of the postponement of a decision on color, a system different from CBS is adopted. If the industry fails to provide the assurances required by you—as it must if for no other reason than the time limit alone—then, as a penalty for its noncompliance, you plan immediately to adopt a system which you do not otherwise find adequate for present approval. Every television manufacturer thereupon will be required to commence the manufacture of sets capable of receiving under the CBS system in order to meet the public demand for color which will follow your decision. Existing sets, including those already produced and unsold and in the process of manufacture, will be outmoded, as, obviously the public will insist upon sets embracing the new standards. The entire revamping of our industry will thus be necessitated by your action. The public will, of course, assume by your approval that the CBS color system is an effective and desirable one. Proof to the contrary, after the public has invested money in the actual purchase of receivers, can only result in a loss of faith in television and a serious retardation in the industry.

In view of the great importance of your decision, it should at least rest on firm foundations. An analysis of your report establishes, however, that your proposals are predicated on the ephemeral hope that further experimenta-

tion and possible improvements may subsequently justify your present decision. The keystone of your report is "speculation and hope".

In evaluating the several proposed color systems submitted to you, you considered a number of pertinent factors such as flicker, brightness, contrast, resolution, etc. With respect to practically each one of those factors, you concluded that more information was needed. The following comments from your report are pertinent: (All numbers in parentheses refer to paragraphs in your report.)

> With respect to the potentialities for improvement so far as flicker is concerned you stated that you were anxious to see further testing conducted with long persistence phospors (60). As to the CBS color system: ". . . . If tubes with long persistence phosphors were utilized, it would be possible to increase brightness several fold with no flicker problem. . . . but it is not possible to predict the extent of such improvement without further testing. It should be noted, however, that there is a limitation on the use of very long persistence phosphors with a disc type receiver". (66)

> [fol. 738] As to color breakup and color fringing: "Color breakup and color fringing were observed at the demonstrations on the disc receivers. The use of tubes with long persistence phosphors should minimize color breakup at the receiver. Color fringing, moreover, will still occur due to the use of the color disc at the camera." (82)

> As to brightness-contrast: " . . . Tubes with long persistence phosphors cannot be utilized on disc receivers without a problem of color contamination. . ." (75)

> As to the resolution factor: ". . . There is a reduction in vertical resolution by 23% and horizontal resolution by 46% as compared with the present system. By utilizing horizontal interlace and retaining the horizontal scaning rate suggested by CBS, the vertical resolution would still be reduced by 23% but the horizontal resolution would be approximately the same as monochrome. Further testing is required in order to determine whether this increase can be achieved in practice." (90)

> As to picture texture: ". . . As above stated, the geometrical resolution of the CBS picture was inferior to a picture under the present standards. . . ." (94)
>
> "If horizontal interlace were utilized on the CBS system, the picture texture could be affected thereby. Dot structure or twinkle could appear in the picture. CBS testified that this could be avoided in its system utilizing horizontal interlace. Satisfactory proof of this point requires further testing." (96)

Over and above the foregoing essentials, which require further testing and additional information, you recognized a most fundamental inherent deficiency in the present CBS system. The CBS system is, as a practical matter, limited to receivers of no greater size than 12½ inches. In line with this fact, the estimate computed by you as the cost of adaptation and conversion, namely $125 to $170, is predicated upon tubes no larger than 12½ inches. The tendency in direct view receivers, however, is, as you correctly state, to tube sizes larger than 12½ inches. The public is buying and demanding almost exclusively receivers of more than 12½ inches in size. Thus, even if the CBS system were a fully developed, effective system, as clearly from your own statements it is not, such system is not usable on the vast majority of sets being manufactured and sold. Here again, however, you depend on mere hope and speculation in developments to come. Thus you state that though the tri-color tube may, if sufficiently developed, be utilized in the field sequential system, such a tube has not yet been devised and successfully demonstrated. In your own words [fol. 739] "there is no demonstration on record of a direct view tri-color tube on the CBS system" and "the record does not contain a definitive answer as to whether direct-view tubes larger than 12½ inches are possible with the CBS system". The core of your action is contained in your reasoning on this very vital matter. We quote:

> "Thus two difficult courses of action are open to the Commission. The first course of action is to reopen the record and to have a demonstration on the record wherein a tri-color tube or other technique for displaying large size direct-view pictures could be tried out on the CBS system. The second course of action is to adopt a final decision now promulgating color

standards on the basis of the CBS system with the confidence that since the radio industry has succeeded in creating much larger tube sizes than those demonstrated in 1941 when standards for black and white television were adopted, they would succeed in building apparatus that would eliminate the present limitation in the CBS system as to size of direct view tube." (145)

"The advantage of the first course of action is that the Commission would not be compelled to speculate as to an important basis for its decision but would have a definitive answer on the basis of which to act. . . . The advantage of the second course of action is that it would bring a speedy conclusion to the matters in issue and would furnish to manufacturers a real incentive to build a successful tri-color tube as soon as possible. . . . The disadvantage is that the Commission's determination on an important part of its decision would be based on speculation and hope rather than on demonstrations." (146)

By your own statement, you have decided "to speculate as to an important basis for (your) decision." To predicate changes in the industry of such tremendous magnitude upon "speculation and hope" is, we submit, unsound and improper. It flies, moreover, in the face of your heretofore announced policy:

"Before approving proposed standards, the Commission must be satisfied not only that the system proposed will work but also that the system is as good as can be expected within any reasonable time in the forseeable future. In addition, the system should be capable of permitting incorporation of better performance characteristics without requiring a change in fundamental standards. Otherwise, the danger exists that the standards will be set before fundamental developments have been made with the result that the public would be saddled with an inferior service, if the new changes were not adopted, of if they were adopted, receivers already in the hands of the public would be rendered useless." (18)

[fol. 740] The approval of the CBS system constitutes a present change in fundamental standards without satis-

factory proof that said system is as good as can be expected within the forseeable near future. Further improvement and knowledge of such significant developments as direct view tri-color tubes, long persistence phosphors, and horizontal interlace, to mention a few significant items recognized by you, may require still further changes in fundamental standards. Why then adopt the CBS color system now? Why, if, as you concede, more information is needed with respect to the mentioned developments, don't you afford the requisite time therefor? The failure of the industry to incorporate the proposed bracket standards in its sets—impossible within the time limit prescribed, and wasteful and unnecessary if the CBS system as presently constituted is not finally adopted—is not a justifiable basis for precluding such time for important development. If further time is needed, it is needed regard ess of what the industry does with respect to the proposed bracket standards.

Even if the industry gave you the requested assurances there is no evidence of your sincerity in proposing to postpone a decision ostensibly to seek a better system. Heretofore, you required adequate field testing as the basis for adopting any system and pointed out that:

> "Receivers and transmitters must be subject to numerous tests over a long period of time and at a diversified set of locations and operating conditions so that operation under average home conditions is closely approximated. Without such field testing, there is no assurance that all fundamental defects have been eliminated. There is a great difference between the performance of a system in a laboratory with trained personnel and its operation in the home by the average citizen. In the history of electronics there have been developments which looked promising in theory, and even in operation in the laboratory but which revealed such fundamental defects when subjected to adequate field testing that they had to be abandoned entirely." (138)

[fol. 741] In that connection you have recognized that a minimum time for field testing is 6 months. (8) In the light of the long time that the CBS system has been under consideration (as far back as August 1940 a CBS system

was demonstrated) the time which you propose to allow for demonstration of other systems—December 5th, 1950 to January 5th, 1951,—which embraces Christmas and New Year, seems to be no more than a "holiday weekend". This is wholly inadequate. You are thereby closing the door to significant developments even though there are already, according to your report, improvements with practical, usable, and even revolutionary possibilities, such as the tri-color tube, horizontal interlace and long persistence phosphors, all of which require further testing. These are vital and significant matters which cannot justifiably be foreclosed by the Commission. In addition, there is, as the Commission recognizes "great activity in the color field and . . . since fundamental research cannot be performed on schedule, it is possible that much of the fruit of the research is only now beginning to emerge" and new color systems and improvements in existing color systems are distinct possibilities. (148)

Commissioner Hennock summarizes the immense potentialities and the need for additional time to develop and test the same. She states:

> " . . . Still, the improvement which took place during the course of the hearings, a relatively short time when compared to the previous course of television development, was impressive. There are many indications that intense effort is being exerted to overcome the difficulties inherent in compatible color systems. Off-the-record developments by Hazeltine, General Electric, Color Television, Inc., and RCA may be bringing us a little closer, if not near, to the realization of a practical compatible color system. In any event we should work toward that end with all our energy until the last possible moment, and not foreclose the possibility of its achievement until convinced that it is a practical impossibility. . . "

Pilot Radio Corporation is heartily in favor of color television. But why the precipitate haste in adopting the CBS system? The only possible justification which you advance for now adopting, on "hope and speculation", the CBS system, is the fact that there are presently about seven million television sets in the hands of the public not capable of receiving a black and white picture from CBS color

transmission, similar sets are rapidly being produced, and further delay, in your opinion, would aggravate the compatibility problem. The conclusive answer to your fears [fol. 742-743] has been given by your Chairman. Addressing the National Electronics Conference, after the publication of your report, Mr. Coy stated that the cost of placing brackets in future sets would be "of approximately the same order" as the cost involved in adapting outstanding receivers. It is apparent, therefore, that increased costs will not be incurred as a result of deferring a decision on color. The so-called problem of incompatability, accordingly, is an absolutely untenable basis for disrupting the television industry and subjecting it and the public to tremendous expense at this time in connection with a system which is supported by "hope and speculation" and which, in view of new developments, may soon be proven to be inferior and undesirable.

The nation has already been called upon to devote its maximum efforts to military preparation. Statutory authority for material controls and allocation has already been enacted and executive implementation partly put into effect. Retrenchment and conserved utilization of vital materials in the television industry would appear shortly inevitable. Under such circumstances, to require at this time a revamping of our industry and its facilities would be impracticable and heedlessly wasteful. Commercialization of a still unproven system, which may in a reasonable time be rendered archaic by already indicated improvements, seems neither wise nor lawful. We are, therefore, constrained to voice our definite opposition to your proposals.

Very truly yours,

Pilot Radio Corporation. By Isidor Goldberg, Pres.

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[fol. 744] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

NOTICE—Filed October 30, 1950

Please Take Notice, that on October 30, 1950, at the opening of Court in the forenoon of that day, or as soon thereafter as counsel can be heard, the undersigned will appear before the Honorable Philip L. Sullivan, Judge of the

aforesaid Court, in the courtroom usually occupied by him in the United States Court House, Chicago, Illinois, and shall present to the Court the attached written motion for an order granting Columbia Broadcasting System, Inc., leave to intervene as a defendant in the above-entitled proceeding.

Dated: October 27, 1950.

Arvey, Hodes and Mantynband,
by George L. Siegel, a Member of the Firm, Attorneys for Columbia Broadcasting System, Inc.,
1 North La Salle Street, Chicago, Illinois.

[fol. 745] Of counsel:

Rosenman, Goldmark, Colin & Kaye,
by —— Goldmark, 165 Broadway, New York, N. Y.

To: Weymouth Kirkland, Esq., and Kirkland, Fleming, Green, Martin & Ellis, Esqs., Attorneys for Radio Corporation of America, National Broadcasting Company, Inc., and RCA-Victor Distributing Corporation, 33 North La Salle Street, Chicago, Illinois.

Cahill, Gordon, Zachry & Reindel, Esqs. Of counsel to Radio Corporation of America, National Broadcasting Company, Inc., and RCA-Victor Distributing Corporation, 63 Wall Street, New York, N. Y.

Hon. J. Howard McGrath, Attorney General of the United States, Washington, D. C.

Otto Kerner, Jr., Esq., United States Attorney for the Northern District of Illinois, Chicago, Illinois.

Benedict P. Cottone, Esq., General Counsel, Federal Communications Commission, Washington, D. C.

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[fol. 746] In The United States District Court
[Title omitted]

Motion to Intervene as a Defendant—Filed October 30, 1950

Columbia Broadcasting System, Inc., moves for leave to intervene in the above-entitled action, in order to assert and support the validity of the order of the Federal Communications Commission attacked in the action herein, on the

ground that it was a party in interest to and participated fully in the proceedings before the Federal Communications Commission, entitled:

"In the Matters of
Docket Nos. 8736 and 8975

Amendment of Section 3.606 of the Commission's Rules and Regulations.

Docket No. 9175

Amendment of the Commission's Rules, Regulations and Engineering Standards Concerning the Television Broadcast Service.

Docket No. 8976

Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting," and that its intervention is of right, pursuant to the provisions of Section 402(a) of the Communications Act of 1934, as amended (47 U.S.C. [fol. 747] Section 402(a)), and of Title 28 U.S.C. Section 2323.

Dated: October 27, 1950.

Arvey, Hodes and Mantynband,
by George L. Siegel, Attorneys for Columbia Broadcasting System, Inc., 1 North La Salle Street, Chicago, Illinois.

Of counsel:

Rosenman, Goldmark, Colin & Kaye,
by Walter ——, 165 Broadway, New York, N. Y.

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[fol. 748] In The United States District Court

[Title omitted]

Affidavit of Adrian Murphy—Filed October 30, 1950

State of New York
County of New York, SS:

Adrian Murphy, being duly sworn, deposes and says as follows:

1. I am a senior vice-president and general executive of the Columbia Broadcasting System, Inc., (hereinafter

referred to as CBS) 485 Madison Avenue, New York, New York. I have, and since 1940 (except for the years 1942-1945 when I was in the military service) have had, general supervisory responsibilities over the activities of CBS in the field of color television. I make this affidavit in support of the motion of CBS to intervene in the above-captioned case.

2. CBS is engaged in the business of sound and television broadcasting and in sound and television network broadcasting. The only manufacturing activity of CBS is through it wholly-owned subsidiary, Columbia Records, Inc., which manufactures phonograph records. CBS is not engaged in the manufacture of television receivers, transmitters, cameras, or other television equipment.

[fol. 749] 3. Since 1940, CBS has engaged in the development of a system, known as the field sequential system, of broadcasting television in color. CBS has expended in excess of $4,000,000 in the course of such development. Since commercial broadcasting of color (as in the case of any other kind of sound or television broadcasting) is not permissible until technical engineering standards therefor have been adopted by the Federal Communications Commission (hereinafter referred to as the FCC), CBS has not yet been able to enjoy any revenue from broadcasting the color television system developed by it.

4. CBS was a party to the hearing before the FCC and was the proponent of the field sequential system, standards for which were adopted by the order attacked by plaintiffs in this case. CBS participated fully in such hearing, submitting extensive evidence, comments and proposed findings and conclusions.

5. CBS owns a number of patents, and has applied for a number of additional patents (which patents issued and applied for are more fully described in Exhibit 402 of the record attached to defendants' motions) essential to the manufacture of transmitting and receiving equipment under the field sequential color system. CBS will license, and is licensing, all responsible manufacturers to use such patents at a reasonable fee. As a result of such licensing, CBS expects to receive substantial revenues of many millions of dollars in view of the adoption of standards by the FCC for the field sequential system. If the order of the FCC adopting such standards is set aside and annulled, CBS will be deprived of such revenues.

6. Commercially successful television networking operations depend in large measure on "circulation"—that is, the number of receivers in the hands of the public—and upon the effectiveness of the broadcast as an advertising medium. CBS has developed its method of color television, [fol. 750] adopted by the FCC, in the conviction that color will increase the demand of the public for television receivers and will prove a more effective medium, both in terms of circulation and impact, for advertisers than black and white broadcasts. Accordingly, CBS has completed plans to begin the regular commercial broadcasting of color under the order adopted by the FCC. Such broadcasting is to begin on November 20, 1950, the effective date of the FCC's order, and, within a few weeks thereafter, the CBS color schedule will reach 20 hours a week. A number of advertisers have expressed interest in sponsoring and paying CBS for some of such broadcasts and it is expected the CBS will, by on or about November 20, 1950, complete contracts for such sponsorship. If the FCC order is set aside or annulled, anticipated revenues from sponsors of color broadcasts will also be denied CBS.

Adrian Murphy.

Sworn to before me this 27 day of October, 1950. Emily M. Green, Notary Public, State of New York, No. 31-6638100. Qualified in New York County. Certs. filed with N. Y. Co. Clk. & Reg. Commission expires March 30, 1952. (Seal.)

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[fol. 751] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

STIPULATION—Filed October 30, 1950

It is hereby stipulated and agreed by and between the attorneys for the respective parties hereto:

That the plaintiffs hereby consent to the appearance as of right in the above-entitled proceedings of Columbia Broadcasting System, Inc., (which was a party in interest

to the proceedings before the Federal Communications Commission, entitled:

"In the Matters of
Docket Nos. 8736 and 8975

Amendment of Section 3.606 of the Commission's Rules and Regulations.

Docket No. 9175

Amendment of the Commission's Rules, Regulations and Engineering Standards Concerning the Television Broadcast Service.

Docket No. 8976)

Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting"

pursuant to the provisions of Section 402(a) of the Communications Act of 1934, as amended (47 U.S.C. Section [fol. 752] 402(a)), and of Title 28 U.S.C. Section 2323, and an order may be entered upon this stipulation without notice to the parties herein.

Dated: October 28, 1950.

Weymouth Kirkland, by Weymouth Kirkland, Kirkland, Fleming, Green, Martin and Ellis, by Weymouth Kirkland, Attorneys for Radio Corporation of America, National Broadcasting Company, Inc. and RCA-Victor Distributing Corporation.

Cahill, Gordon, Zachry & Reindel, by John W. Childs, of counsel to Radio Corporation of America, National Broadcasting Company, Inc. and RCA-Victor Distributing Corporation.

Attorney General of the United States, by John F. Baecher.

United States Attorney for the Northern District of Illinois, by Anthony Scariano.

Federal Communications Commission, by Max Goldman.

[fol. 753] Received copies of the foregoing Notice and the foregoing Motion to Intervene as a Defendant.

Weymouth Kirkland, Esq., and Kirkland, Fleming, Green, Martin & Ellis, Esqs., Attorneys for Radio Corporation of America, National Broadcasting Company, Inc. and RCA-Victor Distributing Corporation, by Weymouth Kirkland.

Honorable J. Howard McGrath, Attorney General of the United States, by John F. Baecher.

Otto Kerner, Jr., Esq., United States Attorney for the Northern District of Illinois, by Anthony Scariano.

Benedict P. Cottone, Esq., General Counsel, Federal Communications Commission; by Max Goldman.

Dated: October 30th, 1950.

[fol. 753a-754] [File endorsement omitted.]

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[fol. 755] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

NOTICE—Filed October 30, 1950

Please Take Notice, that on the 14th day of November, 1950, at the opening of Court in the forenoon of that day, or as soon thereafter as counsel can be heard, the undersigned will appear before the Honorable Philip L. Sullivan, Judge of the aforesaid Court, and such other judges as may constitute the statutory three-judge court, convened or to be convened in the above-entitled action, and shall, upon the complaint in this action, and upon all the other papers and proceedings heretofore or coincidentally filed and had herein, present to the Court written motions to dismiss the complaint or, in the alternative, for summary judgment.

Dated: October 27, 1950.

Arvey, Hodes and Mantynband, by George L. Siegel, A Member of the Firm, Attorneys for Columbia Broadcasting System, Inc., 1 North La Salle Street, Chicago, Illinois.

[fol. 756] Of Counsel:

Rosenman, Goldmark, Colin & Kaye, by ——, Goldmark, A Member of the Firm, 165 Broadway, New York, N. Y.

To:

Weymouth Kirkland, Esq., and Kirkland, Fleming, Green, Martin & Ellis, Esqs., Attorneys for Radio Corporation of America, National Broadcasting Company, Inc. and RCA-Victor Distributing Corporation, 33 North La Salle Street, Chicago, Illinois.

Cahill, Gordon, Zachry & Reindel, Of counsel to Radio Corporation of America, National Broadcasting Company, Inc. and RCA-Victor Distributing Corporation, 63 Wall Street, New York, N. Y.

Hon. J. Howard McGrath, Attorney General of the United States, Washington, D. C.

Otto Kerner, Jr., Esq., United States Attorney for the Northern District of Illinois, Chicago, Illinois.

Benedict P. Cottone, Esq., General Counsel, Federal Communications Commission, Washington, D. C.

[fol. 757] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

MOTION TO DISMISS THE COMPLAINT OR, IN THE ALTERNATIVE, FOR SUMMARY JUDGMENT—Filed October 30, 1950

Upon the complaint herein, and the exhibits annexed thereto; and upon all the other papers and proceedings heretofore or coincidentally filed and had herein, including the record comprising the notices, hearings, demonstrations, petitions, reports, opinions, and orders of the Federal Communications Commission in the proceedings entitled:

"In the Matters of
Docket Nos. 8736 and 8975

Amendment of Section 3.606 of the Commission's Rules and Regulations.

Docket No. 9175

Amendment of the Commission's Rules, Regulations and Engineering Standards Concerning the Television Broadcast Service.

Docket No. 8976

Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting."

the intervenor-defendant Columbia Broadcasting System, [fol. 758] Inc., in the above-entitled action moves this Court to dismiss the complaint or, in the alternative, for summary judgment in its favor.

The grounds of the motion to dismiss the complaint are:

1. With respect to plaintiffs Radio Corporation of America, National Broadcasting Company, Inc., and RCA-Victor Distributing Corporation, the complaint fails to state a claim upon which relief can be granted.

2. With respect to plaintiffs National Broadcasting Company, Inc., and RCA-Victor Distributing Corporation, the Court lacks jurisdiction of the subject matter of the claims asserted by the aforesaid two plaintiffs. Neither of these

plaintiffs has standing to bring this action, and therefore no justiciable controversy is presented by their complaint.

The grounds of the motion for summary judgment, with respect to each of these plaintiffs, are:

Even if the Court have jurisdiction of the subject matter of this action as to all plaintiffs, the complaint and the exhibits attached thereto, and all the other exhibits, papers and proceedings heretofore or coincidentally filed and had herein, show that there is no genuine issue as to any mate-
[fol. 759] rial fact and that defendant-intervenor Columbia Broadcasting System, Inc., is entitled to judgment as a matter of law.

Dated: October 27, 1950.

Arvey, Hodes and Mantynband, by George L. Siegel, A Member of the Firm, Attorneys for Columbia Broadcasting System, Inc., 1 North La Salle Street, Chicago, Illinois.

Of counsel: Rosenman, Goldmark, Colin & Kaye, by —— Goldmark, a Member of the Firm, 165 Broadway, New York 6, N. Y.

[fol. 760] Received copies of the foregoing Notice and the foregoing Motion to Dismiss the Complaint or in the alternative for Summary Judgment this 30th day of October, 1950.

Weymouth Kirkland, Esq., and Kirkland, Fleming, Green, Martin & Ellis, Esqs.,
Attorneys for Radio Corporation of America, National Broadcasting Company, Inc., and RCA-Victor Distributing Corporation,
by Weymouth Kirkland.

Honorable J. Howard McGrath,
Attorney General of the United States,
by John F. Baecher.

Otto Kerner, Jr., Esq.,
United States Attorney for the Northern District of Illinois,
by Anthony Scariano.

Benedict P. Cottone, Esq.,
General Counsel, Federal Communications Commission,
by Max Goldman.

[fols. 760a-761] [File endorsement omitted.]

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[fol. 762] IN THE UNITED STATES DISTRICT COURT

NOTICE—Filed November 10, 1950

The Honorable John Howard McGrath, Attorney General of the United States of America, Department of Justice, Washington, D. C.

Federal Communications Commission, Washington, D. C.

Honorable Otto Kerner, Jr., United States Attorney for the Northern District of Illinois, U.S. Court House, Chicago, Illinois.

Mr. Weymouth Kirkland and Kirkland, Fleming, Green, Martin & Ellis, Attorneys for Plaintiffs, 33 N. La Salle Street, Chicago, Illinois.

Schapiro and Schiff, Attorneys for Pilot Radio Corporation, 38 S. Dearborn Street, Chicago, Illinois.

Arvey, Hodes and Mantynband, Attorneys for Columbia Broadcasting System, Inc., 1 N. La Salle Street, Chicago, Illinois.

Please take notice that on Friday, the 10th day of November, 1950, at the hour of 10:00 o'clock in the forenoon, or as soon thereafter as counsel may be heard, we shall appear before the Honorable Philip L. Sullivan, United States District Judge, at his Courtroom in the United States Court House, 225 S. Clark Street, Chicago, Illinois, or before such [fol. 763] other judge of said court as may be hearing matters in his place and stead and shall at said time and place present the motion of Wells-Gardner & Co., an Illinois corporation, to intervene as a Plaintiff in the above entitled cause, a copy of said motion together with a copy of the proposed complaint of Wells-Gardner & Co., an Illinois corporation, being herewith served upon you, and shall move for the entry of an order granting said motion to intervene and ruling upon the parties in interest, to plead to the complaint of said Wells-Gardner & Co., an Illinois corporation.

At which time and place you may appear if you so see fit.

Righeimer and Righeimer, Attorneys for Applicant for Intervention, Wells-Gardner & Co.

Righeimer and Righeimer, 135 S. La Salle Street, Chicago, Illinois.

[fol. 764] State of Illinois,
County of Cook, ss:

Dora Judge, being first duly sworn, on oath deposes and says that she served the foregoing notice on The Honorable John Howard McGrath, Attorney General of the United States of America, Federal Communications Commission, Honorable Otto Kerner, Jr., United States Attorney for the Northern District of Illinois, Mr. Weymouth Kirkland and Kirkland, Fleming, Green, Martin & Ellis, Attorneys for Plaintiffs, Schapiro and Schiff, Attorneys for Pilot Radio Corporation, and Arvey, Hodes and Mantynband, Attorneys for Columbia Broadcasting System, Inc., by placing a copy of said notice in stamped, sealed envelopes, properly addressed to the above named, and by depositing said envelopes in the United States mail chute at 135 S. La Salle Street, Chicago, Illinois, postage prepaid, at 5:00 P. M. on the 3rd day of November, 1950.

Dora Judge.

Subscribed and Sworn to before me this 3rd day of November, 1950. Virginia A. Leonard.
[Seal.]

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[fol. 765] In the United States District Court,

[Title omitted]

Motion to Intervene as a Plaintiff—Filed November 10, 1950

To the Judges of the District Court of the United States, for the Northern District of Illinois, Eastern Division:

Wells-Gardner & Co., an Illinois corporation, moves to intervene as a plaintiff in the above entitled cause on the following grounds:

1. Applicant is a corporation engaged in the manufacture of television receivers with its principal place of business in Chicago, Illinois.

2. The above entitled cause was commenced in this court by the filing of a complaint on October 17, 1950.

3. Said complaint seeks to have a certain order of the Federal Communications Commission approving the CBS color television system declared null and void and the promulgation, operation and execution thereof restrained and enjoined.

[fol. 766] 4. Applicant is interested in the above entitled action in that it has been adversely affected by said order of the Federal Communications System and has suffered and will continue to suffer damage as a result thereof unless said order is enjoined and set aside, all as more fully set forth in applicant's proposed complaint herein, a copy of which is attached hereto.

5. Applicant has the right, conferred by statute of the United States, to intervene in this action; see Communications Act of 1934 as amended (48 Stat. 1064, 1093, 63 Stat. 108; 47 U. S. C. Section 402 (a)) and the provisions of Title 28 of the United States Code (28 U. S. C., Sections 2321 to 2325, inclusive).

6. That Wells-Gardner & Co., is inadequately represented in the present proceedings and that it may be bound by a judgment in these proceedings.

7. In the alternative applicant submits that the conditional right conferred upon it by 63 Stat. 108; Title 28 U. S. C. Section 2323 should be recognized and affirmed by this court inasmuch as Wells-Gardner & Co. was and is a corporation interested in the question before the Federal Communications System which is the subject of this complaint heretofore filed in this cause; and inasmuch as applicant's claim and the main action have a question of law and fact in common; and inasmuch as the intervention of applicant will not delay or prejudice adjudication of the rights of the original parties to this action.

Wells-Gardner & Co., by Robert S. Alexander, President.

Righeimer and Righeimer, Attorneys for Applicant for Intervention, 35 S. La Salle Street, Chicago, Illinois.

[fol. 767] *Duly sworn to by Robert S. Alexander. Jurat omitted in printing.*

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[fols. 767a-768] [File endorsement omitted]

[fol. 769] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

INTERVENING COMPLAINT—Filed November 14, 1950

Wells-Gardner & Co., an Illinois Corporation, leave of Court first had and obtained, intervenes in the above entitled cause and for its complaint herein alleges:

1. It brings its action pursuant to the provisions of the Communications Act of 1934, as amended (48 Stat. 1064, 1093 and 63 Stat. 108; 47 U. S. C. Section 402 (a)) and of Title 28 United States Code (28 U. S. C. Sections 1336, 1398, 2284, 2321-25) and Section 10 of the Administrative Procedure Act (60 Stat. 243; 5 U. S. C. Section 1009), to enjoin set aside, annul and suspend an order of the Federal Communications Commission (hereinafter called the "Commission") adopted October 10, 1950 in proceedings entitled "In the Matters of Amendment of Section 3.606 of the Commission's Rules and Regulations (Docket Numbers 8736 [fol. 770] and 8975), Amendment of the Commission's Rules, Regulations and Engineering Standards concerning the Television Broadcast Service (Docket Number 9175) and Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting (Docket Number 8976)", (the order being hereinafter called the "Order"). The effective date of the Order is November 20, 1950.

2. Wells-Gardner & Co., is a corporation duly organized and existing under the laws of the State of Illinois. It resides in the Northern District of Illinois, Eastern Division.

3. The Commission is an administrative tribunal created by said Communications Act of 1934, charged with carrying out the provisions of and enforcing said Act.

4. The United States of America is made a defendant in this suit pursuant to the provisions of the Act of June 25, 1948 (62 Stat. 969; 28 U. S. C. Section 2322), and said Communications Act of 1934 (48 Stat. 1064, 1093, and 63 Stat. 108; 47 U. S. C. Section 402 (a)).

5. Wells-Gardner & Co., is engaged in the manufacture and sale of radio and television receivers for mail order houses, chain store organizations and retail dealers. Some of its customers are Montgomery Ward & Company, Western Auto Supply Company of Kansas City, Gambles'

Skogmo, Inc., of Minneapolis, Western Auto Supply Company of Los Angeles, Schuster Stores of Milwaukee, Fair Store of Chicago, J. L. Hudson Company of Detroit, Halle Brothers of Cleveland, Firestone Tire and Rubber, Akron, Ohio. Since 1925 the Company has been engaged in the manufacture of radio receivers and since 1947 of television [fol. 771] receivers and has spent in excess of a million dollars for development work and facilities for the manufacture of such television receivers pursuant to standards set up by the Federal Communications Commission in 1941.

6. In 1950 up to the date of the filing of this complaint the Company has sold in excess of 60,000 television receivers at a total cost to the purchasers in excess of $11,000,000. It is presently manufacturing 300 sets a day.

7. The Company has an investment in excess of $3,000,000 in plant, machinery, patents and inventory devoted to the manufacture of television receivers and radio receivers.

8. The television receivers which are sold by the Company to the mail-order houses, chain store organizations and department stores hereinabove specified are in turn sold by such organizations direct to the general public and the demand for sets from the Company by such organizations is in turn based upon the demand by the public for such sets.

9. The demand for sets by the general public and consequent demand for sets from the Company by the organizations which it supplies is dependent upon the quality of the television programs broadcast to the general public; this in turn is dependent upon the willingness of advertisers to spend money upon the development of high-class television programs and upon the willingness of the people developing television to spend money in such development.

10. Anything which affects the high quality of broadcasts to the public directly affects the consumption of the products marketed by Wells-Gardner & Co.

[fol. 772] 11. Of the number of television receiver sets distributed to these organizations by Wells-Gardner & Co., and in turn distributed by such organizations to the general public in 1948, 100% were 10 inch tubes or smaller; in 1949, 60.5% were 10 inch tubes, 39.1% were 12 inch tubes, and .4% were 16 inch tubes; in the first four months of 1950, 32.8% were 12 inch tube and 67.2% were 16 inch tube. The Company at the present time, and the industry generally, is tooled for and has bought inventory for and is concentra-

ting its efforts on the manufacture of 16 inch tube sets or larger. Of the sets presently being manufactured by Wells-Gardner & Co., 100% are 16 inch tubes or larger.

12. Because of the fact that it sells directly to large chain and retail houses, who in turn sell directly to the public, the Company is close to the retail market and has a first-hand picture of the buying public's wants and requirements. On the basis of a market analysis made by the Company with its customers and their public it has found that since television receivers have advanced out of the hobby stage to the point where they are becoming a home necessity, the public is demanding better quality pictures. This is demonstrated by the fact that the refinements incorporated in Wells-Gardner and other sets to give better definition on 4 megacycle broadcast band reception have caused an increased demand for all such sets. Any conditions imposed upon the manufacturing industry which interfere with its attempts to improve the quality of pictures necessarily results in adverse buyer reaction and consequently in the lessening of the demand for television receivers.

[fol. 773] 13. The Company has had experience with the public's reaction to and lack of acceptance of short-wave adapters and FM adapters, gadgets which were marketed in an attempt to give the standard radio sets these additional receptions. The Company has found that the American housewife would not have her furniture altered by these additions. The Company has been totally unable to market this type of equipment.

14. The development of a widely accepted television industry; the phenomenal growth in the use of television receivers, in the quality of television broadcasting and receiving; the great increase in the amount of money spent on advertising in this industry, all have been bottomed on the fact that the industry could make investments in and spend money upon the manufacture of sets with the assurance that the standards for television receivers had been firmly established as a result of extended hearings before the Federal Communications Commission prior to 1941 and by the continued manufacture of sets pursuant to the standards as promulgated by the Commission in 1941.

15. This was the situation at the time the order complained of herein was entered by the Federal Communications Commission.

16. The standard television broadcast of today as established by the FCC standards is a broadcast of 30 still pictures a second with each picture having 525 lines. The CBS proposed color television broadcast would be a broadcast of 24 still pictures a second, each having 405 lines. Every set manufactured by Wells-Gardner & Co., and every set manufactured by the industry today, is able to receive only the broadcast of 30 still pictures a second, containing [fol. 774] 525 lines each. This means that if no additional work is done on the television receiver sets in the hands of the public and no additional money is expended, the television receivers in the hands of the public could not receive the CBS color television broadcasts in either black and white, or color. In order to permit of receiving the CBS color broadcasts in black and white, the present set would have to have placed in it what is called an "adapter". Estimates indicate this accessory if manufactured in quantity would retail at $40.00 to $50.00 plus installation costs, and after it has been put into the present television receiver, that receiver could still not get the color picture being broadcast by CBS. In order to get the CBS color picture an additional gadget would have to be purchased and put upon the television receiver. This gadget is sometimes referred to as a "color converter" and consists of a large wheel which is placed in front of the television receiver and which spins during the reception of the color broadcast at 1440 revolutions per minute plus a motor necessary to spin the color wheel and synchronize the equipment. Estimates indicate that this gadget can be manufactured in quantity at $100.00 to $200.00. Thus only by an additional expenditure of approximately $200.00, which is more than the present retail price of many black and white television receiver sets which deliver equal picture size, can the television receiver sets which are now in everyone's home be adapted to receive the CBS color picture. But even when this is done the picture received is not of the same high fidelity and definition which it is now possible to receive [fol. 775] on standard black and white receivers and such degradation cannot be corrected as long as the broadcast is one of 24 still pictures a second, containing 405 lines.

17. Even after the expenditure of these sums for adapters and converters, the set owner will receive a picture which is degraded, has a higher flicker content, and is limited to

a picture of 10 inches to 12½ inches in diameter as compared to the 16 inch or larger picture which he now is accustomed to receive.

18. On the other hand, there are in process of development, compatible color television systems that will broadcast color television with 525 lines per picture and 30 pictures per second.

The color broadcast of such systems will serve all 8 to 10 million owners with television pictures in black and white and also serve owners of new color television receivers with pictures in color.

Such pictures received in either black and white or color will be 16 inch, 20 inch or 24 inch in diameter, of fine definition without annoying flicker and provide a 25 to 40 million viewing audience to justify the advertising expense for good programs and finally, to make color television an added form of home entertainment.

The result is that the present television receiver owners will not be required to make additional expenditures and will not be afraid of set obsolescence.

[fol. 776] 19. Wells-Gardner & Co., sought to intervene in the hearing before the FCC on the question of what color standards should be adopted in order to present to the Commission its experience and researches as to public reaction to the various types of color standards advocated. Permission to intervene was denied.

20. Wells-Gardner & Co., is a member of the Radio and Television Manufacturers Association, formerly the Radio Manufacturers Association, which was made a party by the Commission to its hearings.

21. Since the adoption of the order of the Commission of October 10, 1950 various statements and broadcasts have been made by CBS and its employes which in effect informed the public that it would be undesirable for the public to purchase a standard black and white television receiver for a period of at least six months.

22. As a result of the action of the Commission, in promulgating its order of October 10, 1950 and as a result of such commentaries on the order by persons, informed and uninformed, orders for the purchase of standard black and white television receiver sets have fallen off considerably. Contracts entered into by Wells-Gardner & Co., for the sale of standard black and white television receiver

sets have been cancelled in the sum of $300,000 and it is likely that other purchasers will seek to cancel contracts in the near future. Orders for sets in the future, have decreased with the result that Wells-Gardner & Co., has and will suffer substantial financial loss.

[fol. 777] 23. The effect of the order complained of is to impair the existing market for black and white television receivers to the irreparable injury of Wells-Gardner & Co.

24. The effect of the order is to authorize the commercial broadcast of CBS color programs to the exclusion of other color programs and other color television standards with the result that the customers of Wells-Gardner & Co., will not be able to receive such color broadcast programs, even in black and white, without great additional expense and inconvenience of operation. This in turn results in destroying the reputation that Wells-Gardner & Co., has built up over a period of 25 years in the radio and television receiver field.

25. The effect of the order of the Commission is to deprive Wells-Gardner & Co., of income which was assured prior to the order of the Commission.

26. The Commission's order is illegal and void and beyond the power, authority and jurisdiction of the Commission for the following reasons:

A. The order deprives Wells-Gardner & Co., of property without due process of law, contrary to the Fifth Amendment of the Constitution of the United States.

B. The order of the Commission is arbitrary and capricious and results from the failure of the industry to comply with conditions imposed by the Commission which were illegal and beyond its authority to impose.

C. The order is unsupported by substantial evidence.

[fol. 778] D. The substantial evidence produced by the industry as a whole demonstrates that the system which the order of the Commission seeks to authorize is detrimental to the best interests of the public and of the advance of television broadcasting.

E. The order is invalid and illegal because of the refusal of the Commission to hear testimony of Wells-Gardner & Co., and other affected organizations which sought to give the Commission the benefit of their experience in the television field.

F. The order is contrary to the public interest, convenience and necessity.

G. The order violates Section 303(g) of the Communications Act of 1934.

H. The order is contrary to the terms of the Commission's notice of July 11, 1949.

27. The intervening complainant has no adequate remedy at law.

Wherefore,

1. Intervenor prays that the specially constituted Court of three judges convened to hear this matter issue a temporary interlocutory injunction herein restraining, enjoining and suspending until further order of this Court, the promulgation, operation and execution of the order of October 10, 1950 of the Federal Communications Commission.

2. That after final hearing this Court order, adjudge and decree that said order of the FCC is beyond the lawful [fols. 779-780] authority of the Commission, is in violation of the legal rights of the intervenor, and is wholly void, arbitrary and unreasonable and that its promulgation and operation be perpetually enjoined so that it be vacated and set aside.

3. That the intervenor have such other and further relief in the premises as is equitable and just and as may be deemed by this Court to be adequate and proper.

Wells-Gardner & Co., an Illinois corporation, by Robert S. Alexander, President.

Righeimer and Righeimer, by Frank S. Righeimer, Attorneys for Intervenor, 135 S. LaSalle Street.

*Duly sworn to by Robert S. Alexander. Jurat omitted in printing.*

[fol. 781] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

NOTICE—Filed November 10, 1950

To: Attorney General of the United States, Washington, D. C.;

United States Attorney for the Northern District of Illinois, United States Court House, Chicago, Illinois;

Federal Communication Commission, Washington, D. C.;

Kirkland, Fleming, Green, Martin & Ellis, Weymouth Kirkland, 33 N. La Salle Street, Chicago, Illinois;

Arvey, Hodes & Mantynband, One N. LaSalle Street, Chicago, Illinois;

Schapiro and Schiff, 38 S. Dearborn Street, Chicago, Illinois.

Please take notice that on November 10, 1950, at the opening of Court in the forenoon or as soon thereafter as counsel can be heard, the undersigned will appear before the Honorable Philip L. Sullivan, Judge of said Court, in the courtroom usually occupied by him in the United States Court House, Chicago, Illinois, and shall then and there present to the Court the motion of Television Installation Service Association to intervene as a plaintiff in the above-entitled cause, copies of which said motion and the proposed intervening complaint are served upon you herewith.

Schradzke and Gould, by Gerald Ratner, Attorneys for Television Installation Service Association, 33 N. La Salle Street, Chicago, Illinois.

[fol. 782] AFFIDAVIT OF SERVICE

STATE OF ILLINOIS,
County of Cook, ss:

Henry Litvak being first duly sworn on oath deposes and says that on the 4th day of November, 1950, at 12:30 P.M. Central Standard Time, he served the foregoing notice, together with a copy of motion attached thereto on the persons listed in said notice by placing a copy of said notice and of said motion in envelopes addressed respectively to said persons at the addresses set forth in the foregoing notice, and affixing to each of said envelopes the

required amount of United States postage stamps; that the envelopes addressed respectively to the Attorney General of the United States, to the United States Attorney for the Northern District of Illinois, and to the Federal Communications Commission, were sent by registered mail, return receipt requested; that the envelopes addressed to the other said persons were sent by ordinary mail; that each of said envelopes and contents were deposited at the United States Post Office in the United States Court House, Clark and Adams Streets, Chicago, Illinois, on said date and at said time.

Henry Litvak.

Subscribed and sworn to before me this 4th day of November, 1950. Martha Merkel, Notary Public.

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[fol. 782a] [File endorsement omitted.]

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[fol. 783] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

MOTION TO INTERVENE AS PLAINTIFF—Filed November 10, 1950

Television Installation Service Association, by its attorneys, moves to intervene as a Plaintiff in the above entitled action, pursuant to Rule 24 of the Federal Rules of Civil Procedure, on the following grounds:

1. A statute of the United States (Title 28 United States Code, Section 2323) confers an unconditional right on applicant to intervene herein. Applicant is an association interested in the proceeding and controversy before the Federal Communications Commission, in which the Order complained of was issued. Applicant is interested in the above entitled action commenced under Sections 2321-2325 of Title 28 United States Code to enjoin, set aside, annul and suspend the said Order of the Federal Communications Commission. The said action involves the validity of such Order and the interest of applicant.

2. The representation of applicant's interest by the existing parties may be inadequate, in that none of them is engaged in the television service industry in which applicant's members are engaged. The controversy presents [fol. 784] additional problems peculiar to the television service industry. Applicant may be bound by the judgment in the action.

3. In the alternative, applicant's claim and the main action have questions of law and of fact in common. Intervention by applicant will not unduly delay or prejudice the adjudication of the rights of the original parties.

Annexed to this Motion is the proposed intervening complaint of applicant.

Television Installation Service Association,
Schradzke and Gould, by Gerald Ratner, Its Attorneys.

Schradzke and Gould, Attorneys for Television Installation Service Association, 33 North LaSalle Street, Chicago 2, Illinois.

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[fol. 785] IN THE UNITED STATES DISTRICT COURT

[Title omitted]

INTERVENING COMPLAINT OF TELEVISION INSTALLATION SERVICE ASSOCIATION—Filed November 14, 1950

This intervening plaintiff, Television Installation Service Association (hereinafter referred to as "intervener"), for its intervening complaint herein, alleges as follows:

1. The original plaintiffs herein, Radio Corporation of America, National Broadcasting Company, Inc., and RCA Victor Distributing Corporation, filed their complaint herein on October 17, 1950, against United States of America and Federal Communications Commission, original defendants, to enjoin, set aside, annul and suspend an order of the Federal Communications Commission relating to color television.

2. Intervener admits each and all of the allegations of said complaint filed herein by said original plaintiffs.

3. Intervener's action, like the action of said original plaintiffs, is brought under the provisions of the Communi-

cations Act of 1934, as amended (48 Stat. 1064, 1093 and 63 Stat. 108; 47 U.S.C. Section 402 (a)) and of Title 28 United States Code (28 U.S.C. Sections 1336, 1398, 2284, 2321-25) [fol. 786] and Section 10 of the Administrative Procedure Act (60 Stat. 243; 5 U.S.C. Section 1009) to enjoin, set aside, annul and suspend the aforesaid order of the Federal Communications Commission, (hereinafter called the "Commission") adopted October 10, 1950, effective November 20, 1950, in proceedings entitled "In the Matters of Amendment of Section 3.606 of the Commission's Rules and Regulations (Docket Nos. 8736 and 8975), Amendment of the Commission's Rules, Regulations and Engineering Standards concerning the Television Broadcast Service (Docket No. 9175) and Utilization of Frequencies in the Band 470 to 890 Mcs. for Television Broadcasting (Docket No. 8976)", (the order being hereinafter called the "Order").

4. Intervener, Television Installation Service Association, is a corporation not for profit duly organized and existing under the laws of the State of Illinois, and resides in the Northern District of Illinois, Eastern Division, having its principal office in the City of Chicago, Illinois.

5. Intervener is a trade association, whose members include approximately 23 business firms, engaged in the installation and servicing of television receivers in the City of Chicago and its suburbs (hereinafter sometimes referred to as the "Chicago area").

6. Of the estimated 8,000,000 television receivers presently in the hands of the public throughout the United States, an estimated 600,000 television receivers are presently located in the Chicago area, representing an estimated audience of approximately 2,000,000 people and an estimated investment by the owners of such television receivers of over $1,500,000.

[fol. 787] 7. The television receiver-owning public in the Chicago area is now spending at the rate of $3,500,000 annually for the installation and servicing of television receivers.

8. More than 1,000 persons are employed by companies engaged in the installation and servicing of television receivers in the Chicago area, of which number more than half are employed by the member firms of intervener. Throughout the United States, many times that number of